JANUARY 7, 1933

Railway Age

FOUNDED IN 1856

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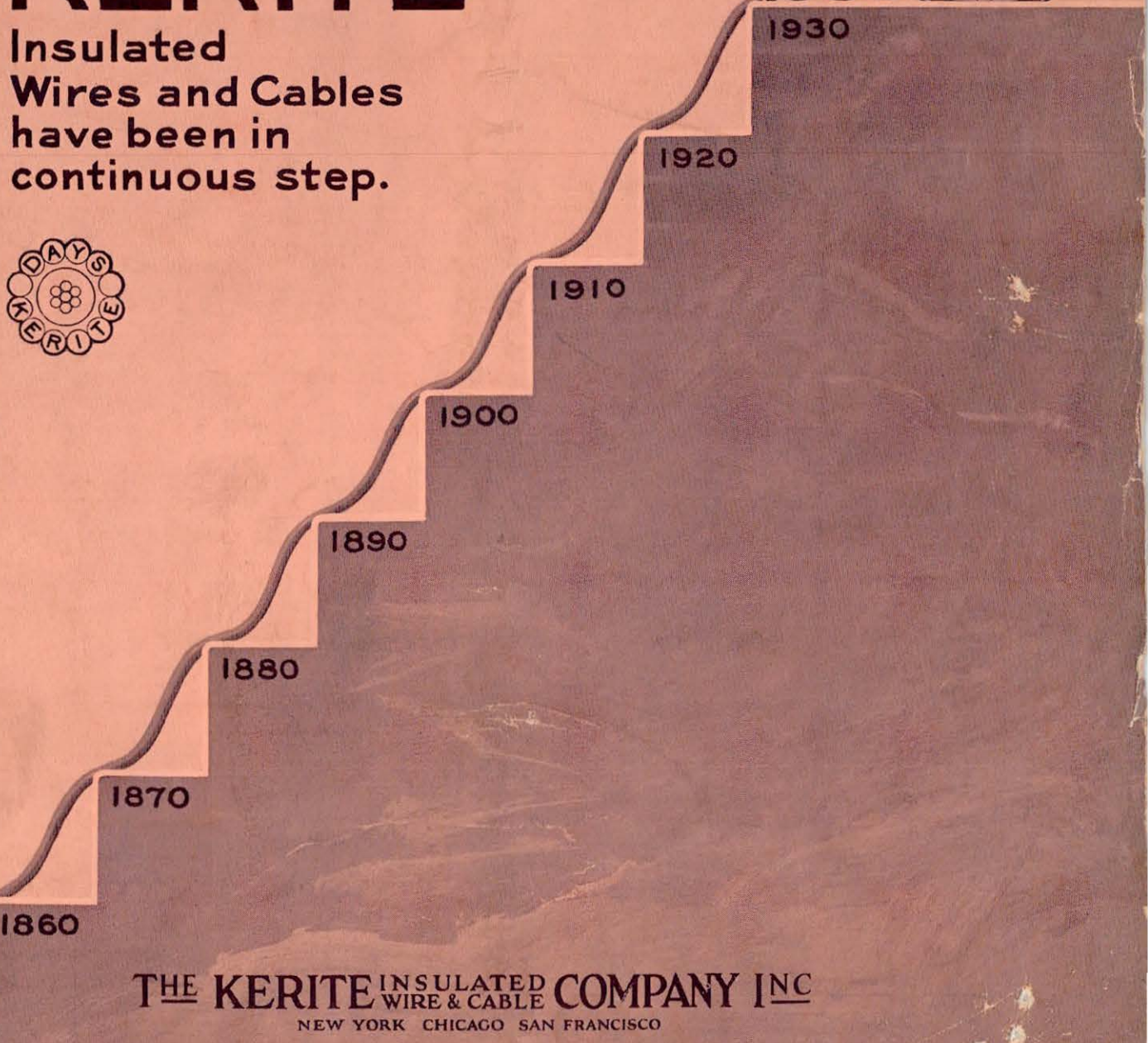
WITH every progressive upward engineering advance since 1850,

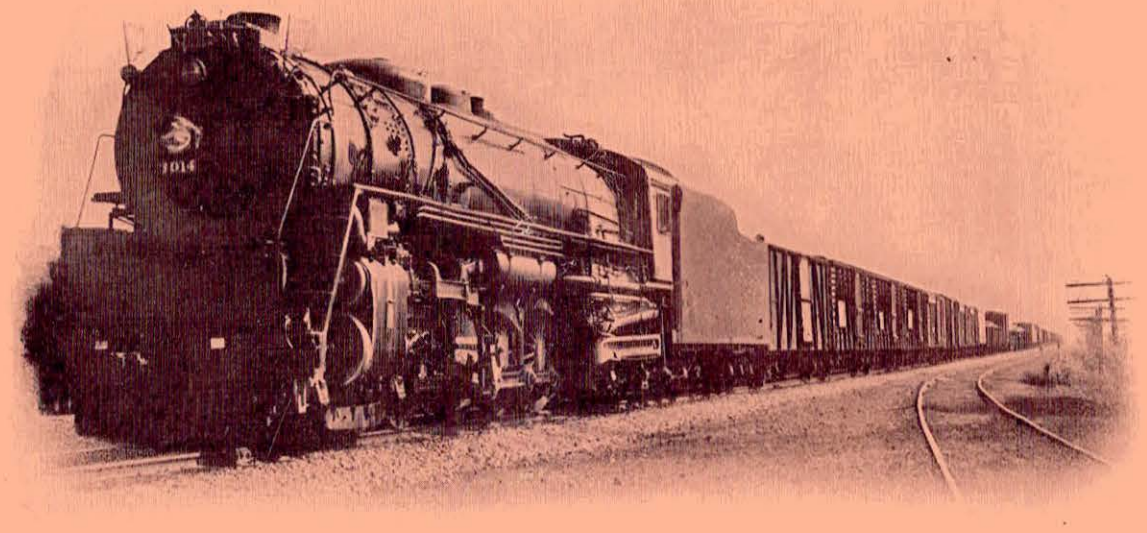
KERITE

Insulated Wires and Cables have been in continuous step.



THE KERITE INSULATED WIRE & CABLE COMPANY INC

NEW YORK CHICAGO SAN FRANCISCO



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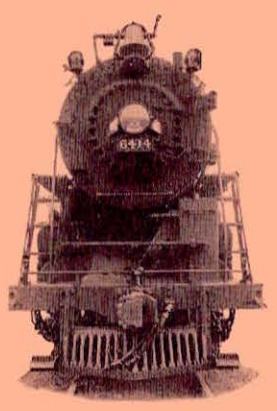
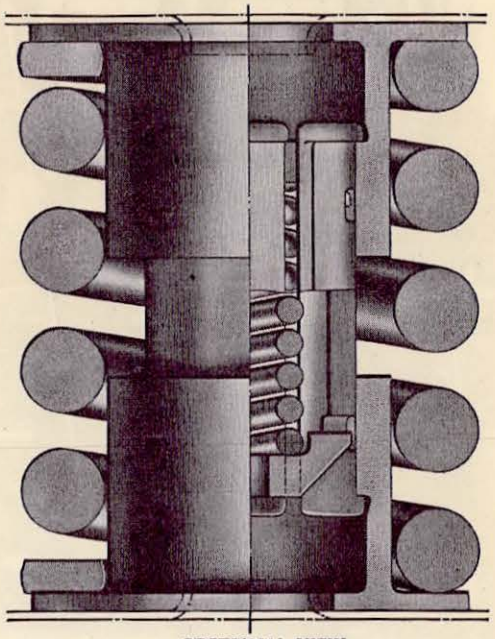


In this, the opening week of the New Year, we extend cordial greetings to our many friends in the Railway World. We believe that the Railways will be the backbone of our Transportation System for many years to come, and that they still have a vast amount of work to do. Our special mission is to aid them in keeping their Motive Power at the highest point of efficiency, and to this we dedicate our best efforts.

THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA

Published weekly by Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, March 9, 1928, at the Post Office at East Stroudsburg, Pa., under the act of March 3, 1879. Application pending transfer as second class matter to Philadelphia, Pa., Post Office.

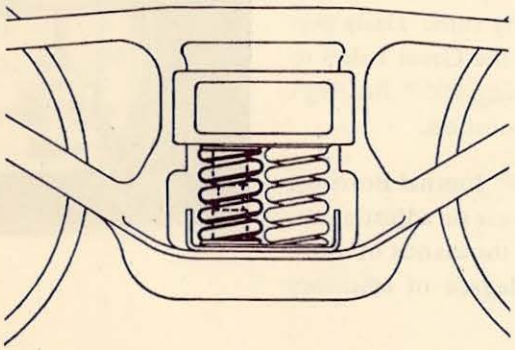
MINER
TRUCK SPRING SNUBBER



SECTIONAL VIEW

PREVENTS damage to lading by eliminating destructive vertical vibration of freight cars.

Saves maintenance expense by reducing truck spring failures.



Does not affect capacity of truck springs.

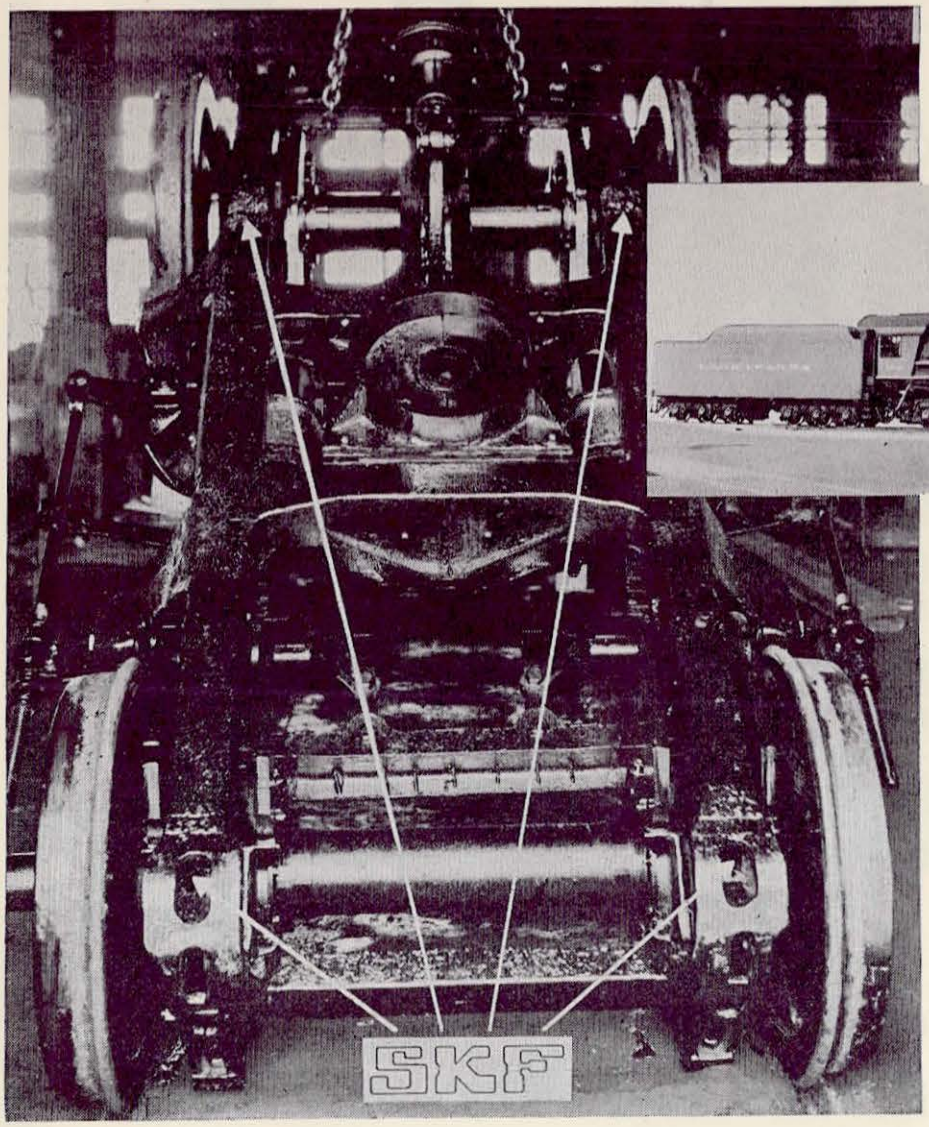
Easily and economically installed.

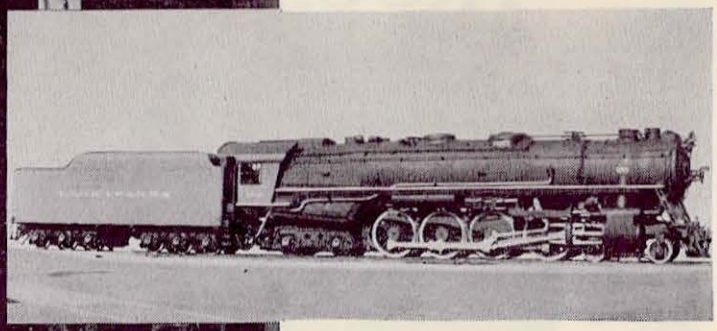
Four snubbers only per car required.

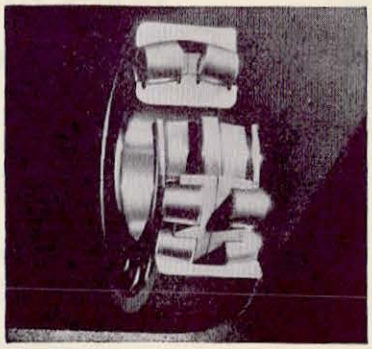
W. H. MINER, INC. CHICAGO

UP and DOWN the LACKAWANNA

with SKF







• FIVE of the powerful Pocono type locomotives on the Delaware, Lackawanna & Western Railroad, are equipped with SKF Journal Bearings on the leading engine trucks . . . for definite reliability on long, heavy-duty runs. Daily performance along this winding "road of scenic beauty from the Great Lakes to the Sea," has proven the dependability and economy of using SKF Bearings under the exacting conditions of service imposed on this location.

Mile after mile, up and down grade and around curves, SKF Journal Bearings maintain a constant lateral movement...without friction, wear or adjustments. Such trouble-free performance continues after hundreds of thousands of miles for SKF ruggedness and stamina assure the highest degree of efficiency throughout a long life.

Maintenance, too, is kept at a minimum for replenishing of lubricant is less frequent, reducing the cost of labor and oil. And there are further savings in the elimination of liners, hub wear and other factors which affect friction bearings. 2972

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The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.).

Subscriptions, including 52 regular weekly issues, payable in advance and postage free; United States and possessions, 1 year $6.00, 2 years $10.00; Canada, including duty, 1 year $8.00, 2 years $14.00; foreign countries, 1 year $8.00, 2 years $14.00.

Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office.

Vol. 94 January 7, 1933 No. 1

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A Million a Day for Supplies in 1932 ..... Page 4

A *Railway Age* survey of railway purchases shows an increase in buying since June, but indicates that millions will be required to catch up on deferred maintenance.

Specialization and the Railroads 9

Many roads are being led further into manufacturing fields than is good either for them or for the country, says R. D. Bartlett.

Are the Railways Backward in Research and Test Work? 11

The answer is emphatically "No!" on many roads; the Pennsylvania's maintenance of way department testing is a good example.

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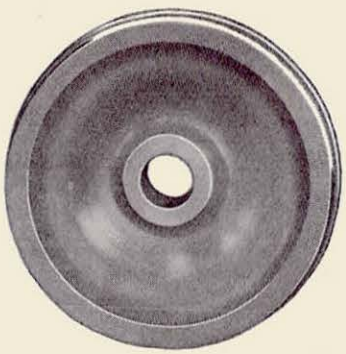
WHEELS OF CHANCE and WHEELS OF DESTINY

STANDARD "QT"

Quenched and Tempered Wrought Steel Wheels

"Wheels of chance" are out of date even though, through chance, an untreated steel wheel may render unexpectedly long service. Nothing is left *to* chance in Standard "QT" Quenched and Tempered Wrought Steel Wheels. They are quenched throughout and tempered to relieve all internal strains at every point throughout the rim, web and hub. They are wheels destined from the start to provide greater strength, hardness and toughness throughout the structure of the steel. 30,000 placed in service in the last six years prove that they have well *fulfilled* their destiny.



STANDARD STEEL WORKS COMPANY

SUBSIDIARY OF THE BALDWIN LOCOMOTIVE WORKS

GENERAL OFFICES & WORKS: BURNHAM, PA.

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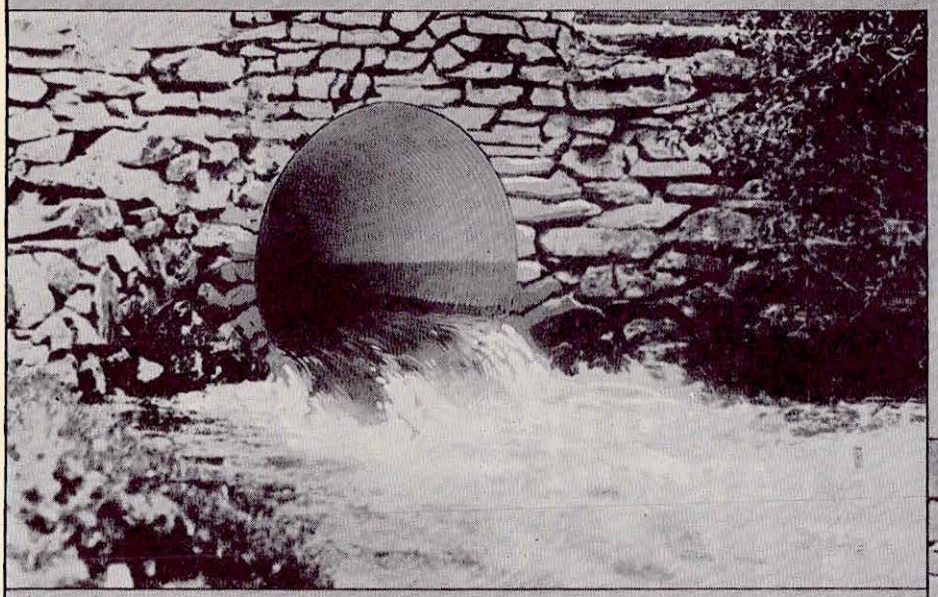
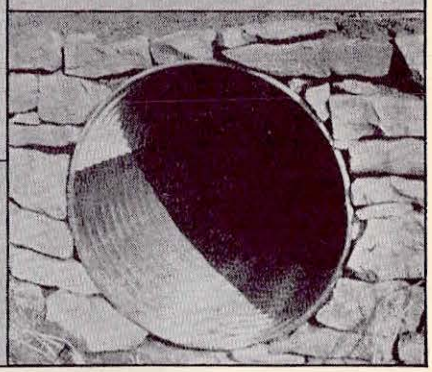
PHILADELPHIA ST. LOUIS SAN FRANCISCO

Designed for TOUGHEST SERVICE





ARMCO

ARMCO PAVED INVERT PIPE *therefore best for*

AVERAGE CONDITIONS

EVERY foot of Armco Paved Invert Pipe is built for the very toughest kind of drainage service—hence, it is bound to last longer under *all* conditions. A look at the inside will show you why. Right at the bottom—where the wear comes—you will see a heavy layer of thick, bituminous material. This tough pavement furnishes a smooth roadway for hydraulic traffic, and yet protects the metal itself from eroding forces such as sand, silt, gravel or boulders.

Feel this protecting pavement with your hands. Notice how tough it is. Then remember that Armco Paved Invert Culverts are the only culverts that have this modern and vital advantage—the only culverts that meet every drainage condition.

The proof of the superior wear-resisting qualities of Armco Paved Invert Pipe is readily available. We will be glad to tell you where it has been used and why it lasts longer—to show you why culverts should be protected in the bottom.

Use the coupon below for getting complete details about Armco Paved Invert Pipe.

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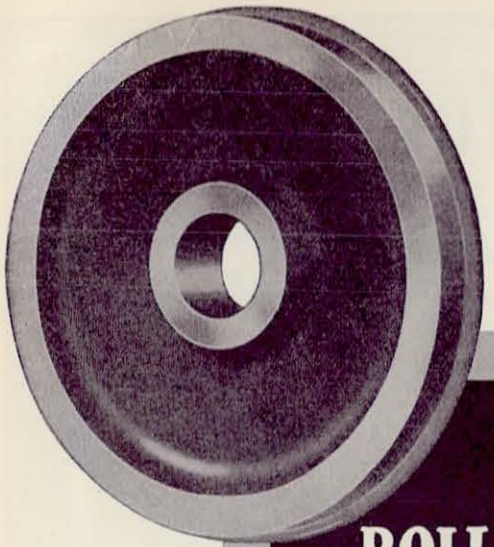

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& CAR WHEEL
TIRES

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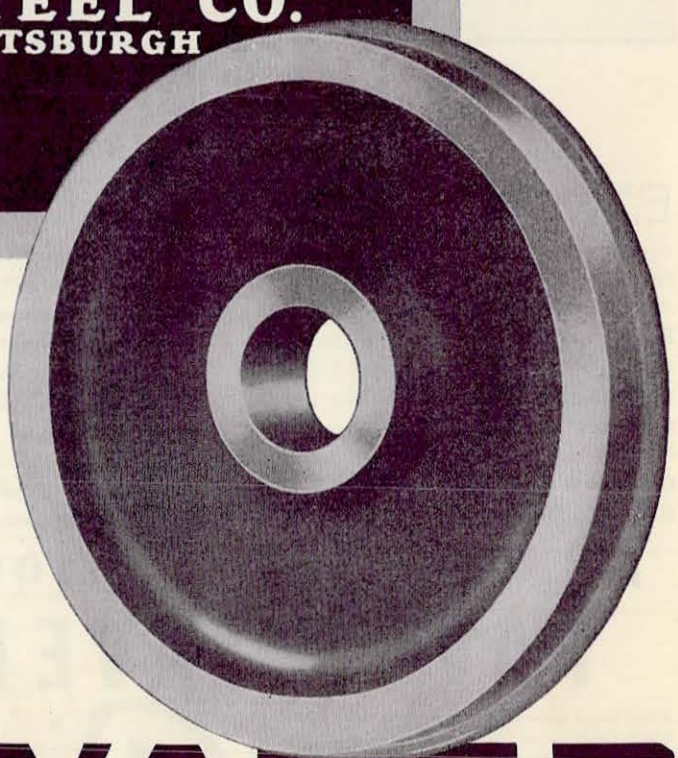

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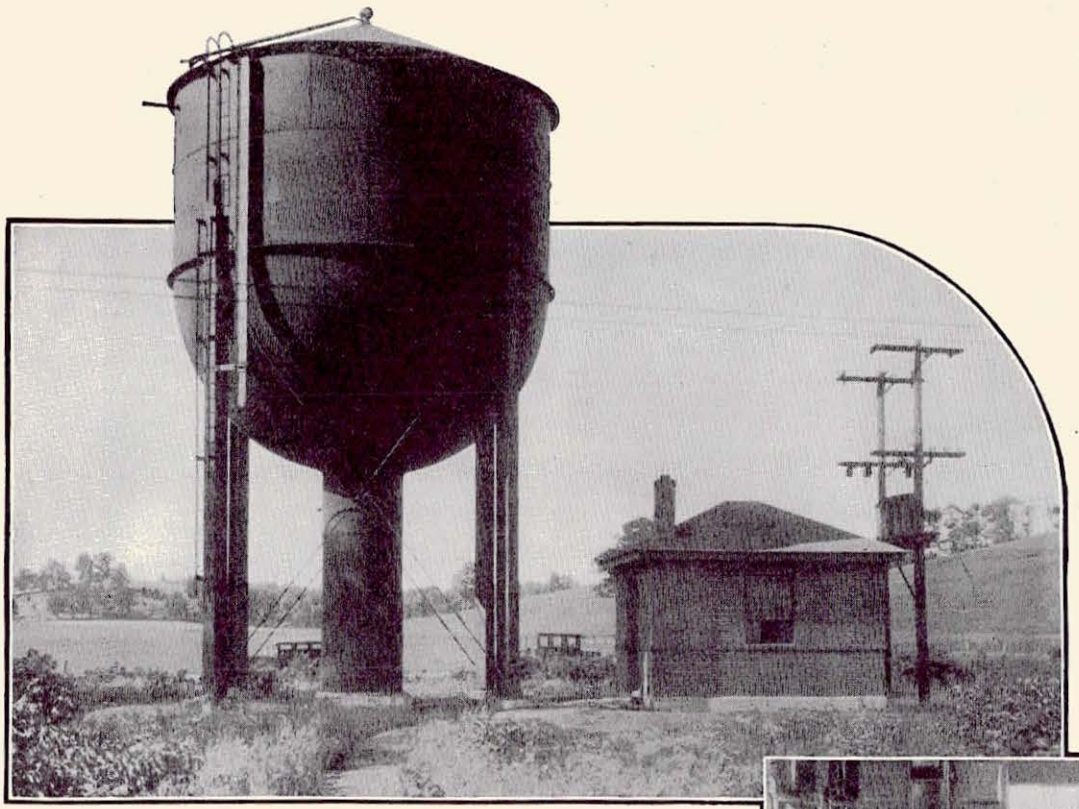
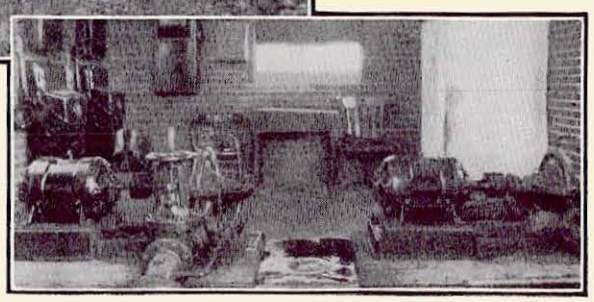


Electrified Wayside Pumping Station with Westinghouse Motor and Control.



WATER SERVICE *Electrification Saves $15,000 annually*

ONE division of a mid-western railroad recently electrified all water pumping stations. There were six pumping plants on the division. Two were operated with steam obtained at engine terminals and the other four had independent steam plants.

Automatic electric pumps were installed at five stations while the sixth was abandoned. At a seventh point a new source of water supply was developed.

The total annual saving on this one division due to water service modernization was approximately $15,000!

This is typical of the opportunities for savings that exist today in the modernization of water pumping facilities on many American railroads.

Westinghouse has a complete line of electrical equipment applicable to this problem, and a staff of experienced engineers to assist you without obligation in making your analysis and to recommend suitable modernization.

Mail the coupon or call the nearest Westinghouse office for literature on modernization of pumping facilities.

One of a series of advertisements featuring self-liquidating modern improvements that many railroads are applying to reduce costs in shops, maintenance of way, and signaling operations.

T 79408 **Westinghouse**

Quality workmanship guarantees every Westinghouse product

MAIL THE COUPON

Westinghouse Electric & Manufacturing Company
Room 2-N, East Pittsburgh, Pa.

Gentlemen: Please send me your literature on Modernization of Water Pumping Facilities.

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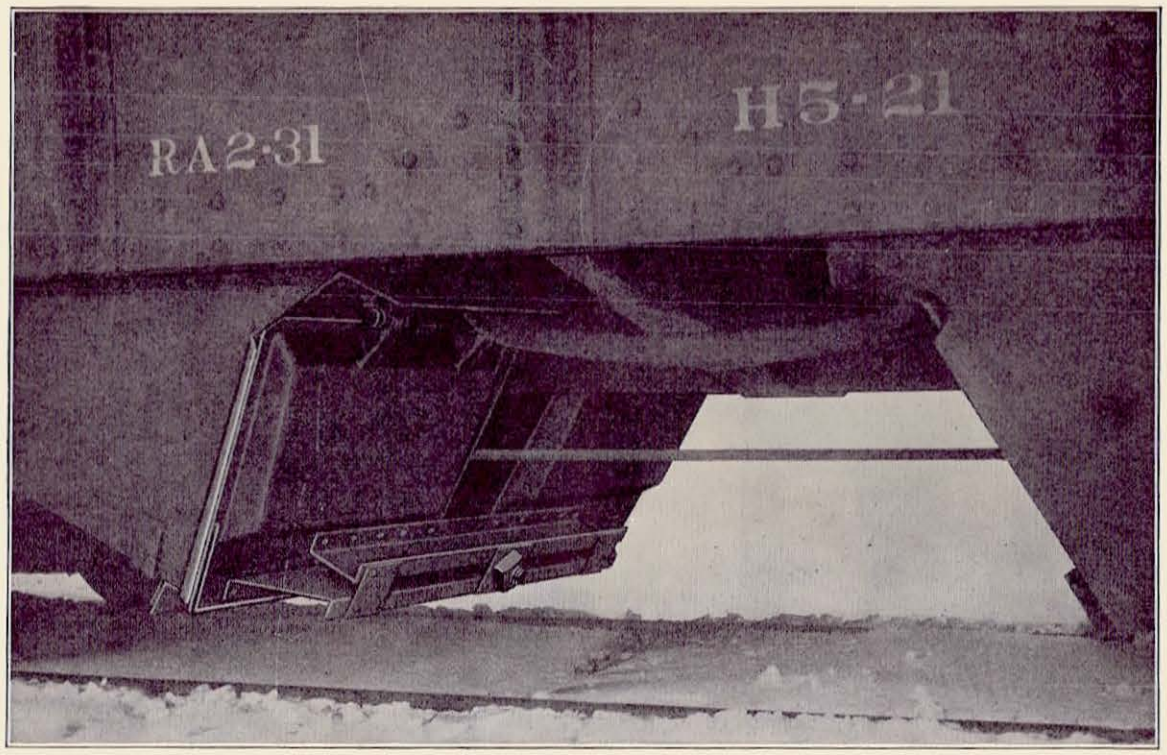


New Ajax Cast Doors

All classes of drop door cars can be readily equipped with these non-corrosive and indestructible cast doors.

Hinge lugs and reenforcements are cast integral with the doors, and many riveted joints, rivets and forgings are eliminated.

The enormous strength of Ajax Cast Doors makes them difficult to distort, thereby assuring against loss of lading and door operating gear troubles. Should they become deformed they can be straightened or welded without any additional work. On the other hand, rolled steel doors require removal of hinges and battens.

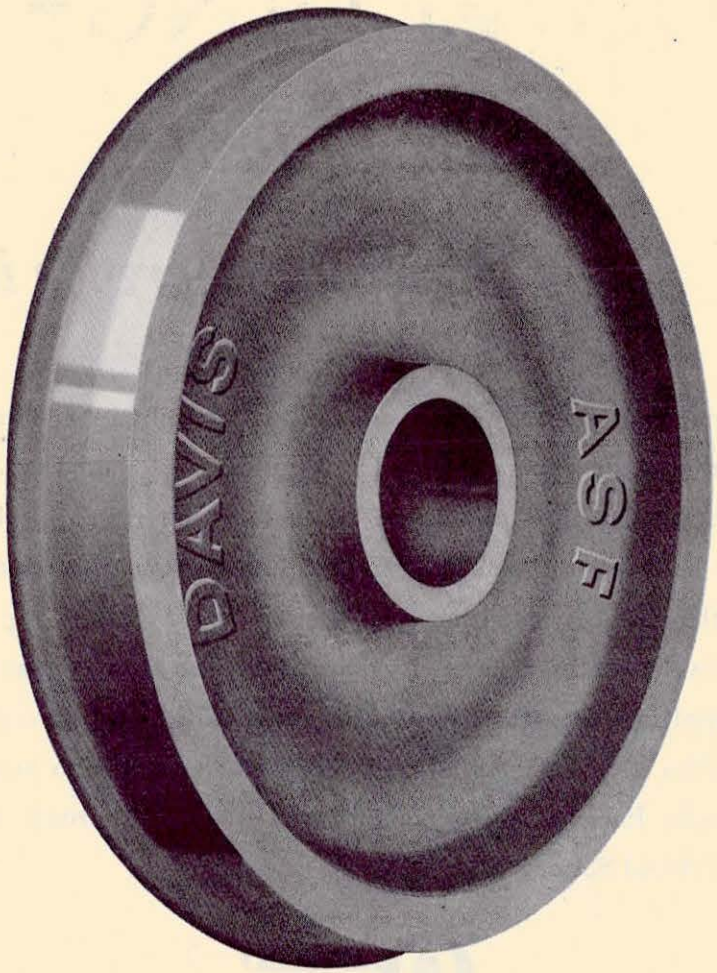
As the non-corrosive nature of cast steel is well known, the life of Ajax Cast Doors should be the life of the car itself. They will outlive three rolled steel doors.

Union Metal Products Company

NEW YORK ST. LOUIS CHICAGO

Montreal Washington Richmond Kansas City Houston San Francisco

THE DAVIS HEAVY SERVICE MULTIPLE WEAR STEEL WHEEL



A wheel designed for use in passenger and tender service where wheels are worked hard, pushed to the very limit and where safety and dependability are of the utmost importance.

It will pay to investigate thoroughly this type of wheel as an efficient aid to heavy high speed transportation.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

OXWELDING—

as dependable

as Railroad Service itself

The dependability of oxwelding and cutting in railroad maintenance is as axiomatic as the dependability of railway service itself. That this is so has not been a matter of chance, but rather the result of closest co-operation between the railroads and an organization that *specializes* in adapting the oxy-acetylene process to railroads' needs. • This organization is The Oxweld Railroad Service Company, whose twenty years' experience in applying oxy-acetylene welding and cutting to railroad maintenance enables it to bring utmost efficiency and economy to every phase of the work. Each year, the majority of Class I railroads find that Oxweld Railroad Service is increasingly valuable.

OXWELD RAILROAD SERVICE

The Oxweld Railroad Service Company

Unit of Union Carbide and Carbon Corporation

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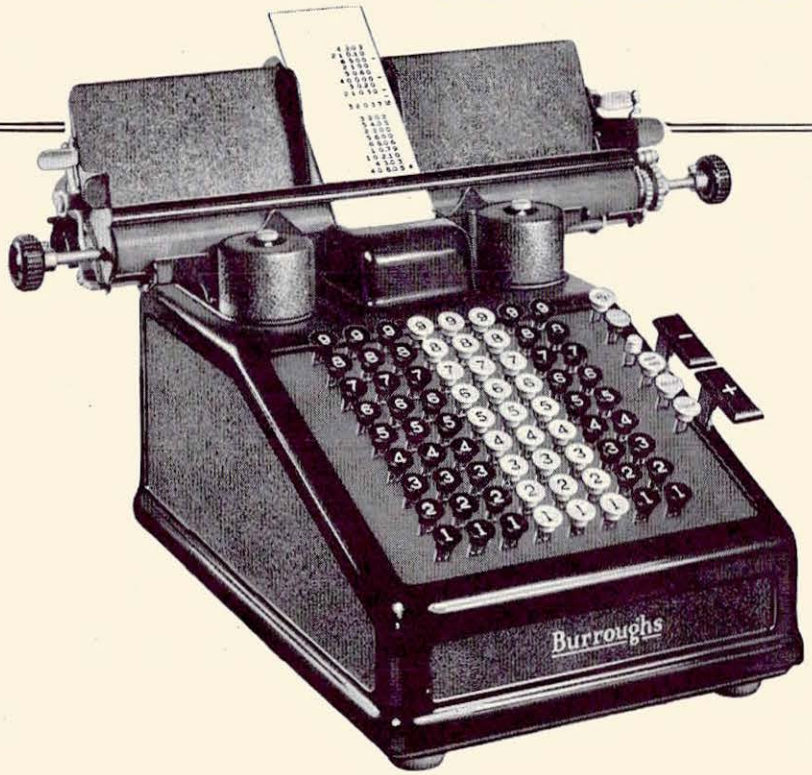
NEW YORK, Carbide and Carbon Building CHICAGO, Carbide and Carbon Building

THIS DESK-SIZE BURROUGHS SUBTRACTS AS QUICKLY AND EASILY AS IT ADDS



AND IT PRINTS A CREDIT BALANCE

There are any number of jobs in an accounting department that this new Burroughs can handle with greater ease, simplicity and economy owing to its speed and ease of operation . . . and its exceptionally low price. In fact, many concerns find it both efficient and economical to use one of these remarkable machines on each desk.

There are many styles and sizes, with either wide or narrow carriage, from which to select a machine exactly suited to the type of work for which it is required.

For a demonstration . . . or for complete information . . . telephone the local Burroughs office or write to the

BURROUGHS ADDING MACHINE COMPANY—DETROIT, MICH.

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TO SUBTRACT—Merely set up the amount on the keyboard and depress the minus motorbar. The amount is instantly subtracted, printed and designated by the symbol (—).

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EXCEPTIONALLY FAST FOR MULTIPLICATION

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS

1847 McCORMICK BLDG. CHICAGO, ILL.

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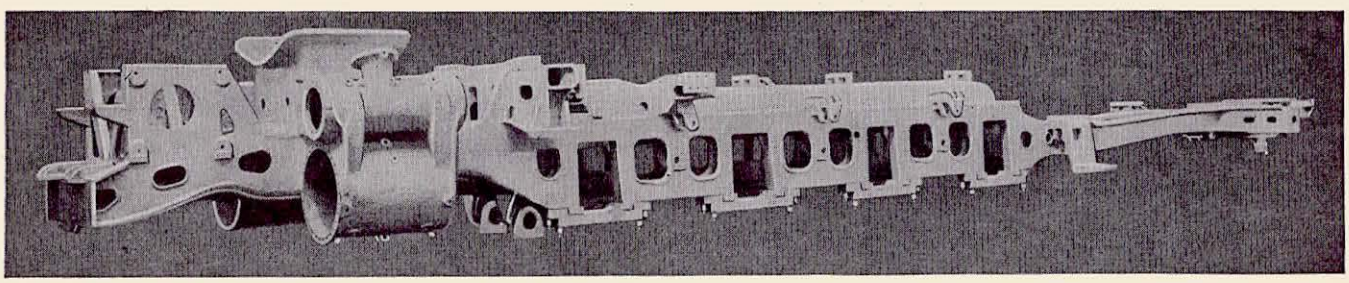
This Association is wholly for keeping Chilled Car Wheels in advance of requirements for service wear, strength and design for use under all railway and industrial equipment now built or contemplated.

Association Engineers are constantly designing to get the best distribution of metal to resist thermal strains and add to wear. The Association conducts its own chemical and physical laboratories for experiment and test purposes to produce new metal alloys of greater strength and wearing qualities.

PROPERLY DESIGNED THE CHILLED CAR WHEEL WILL FULFILL ANY SERVICE CONDITION

Up-to-Date Locomotives Soon Pay for Themselves



ONE-PIECE CAST STEEL LOCOMOTIVE BED WITH INTEGRAL CYLINDERS AND REAR CYLINDER HEADS, AND AIR RESERVOIR

COMMONWEALTH CAST STEEL PRODUCTS

Assure:

Greater Serviceability

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Increased Efficiency

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Lower Operating Costs

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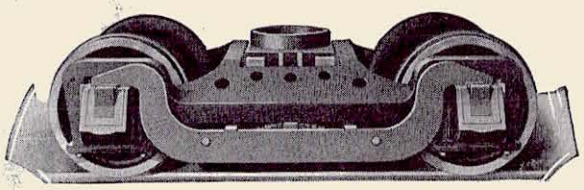
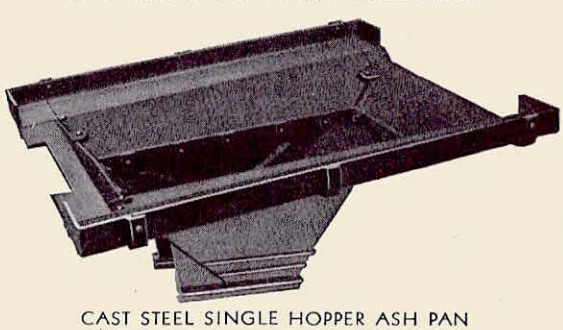
Large Maintenance Savings

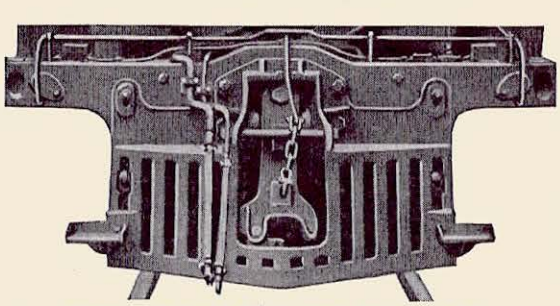


OUTSIDE JOURNAL ENGINE TRUCK

FOUR WHEEL DELTA TYPE TRAILER TRUCK



CAST STEEL SINGLE HOPPER ASH PAN



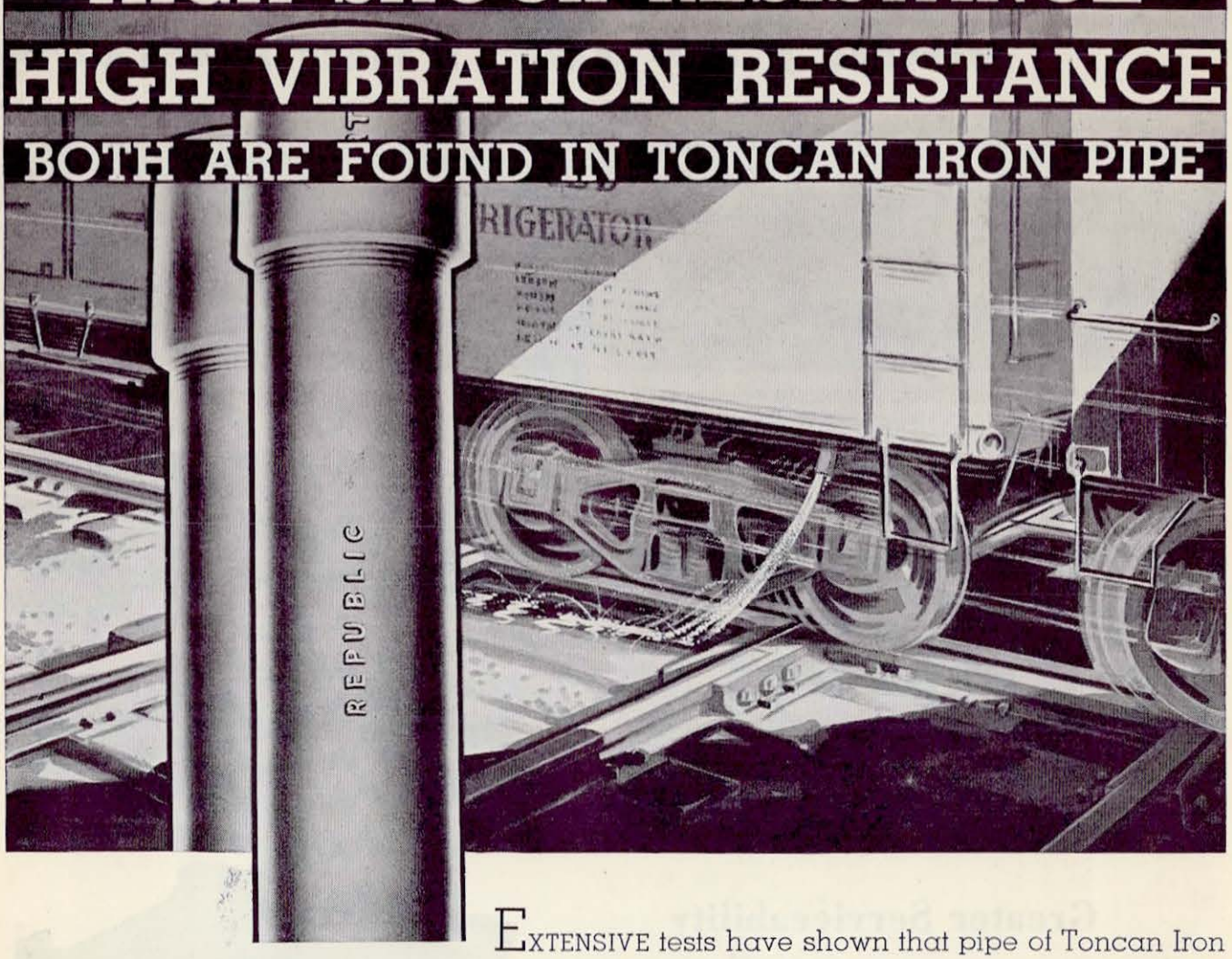
IMPROVED CAST STEEL ONE-PIECE PILOT

GENERAL STEEL CASTINGS CORPORATION

COMMONWEALTH PRODUCTS

EDDYSTONE, PA. GRANITE CITY, ILL.

HIGH SHOCK RESISTANCE
HIGH VIBRATION RESISTANCE
BOTH ARE FOUND IN TONCAN IRON PIPE



EXTENSIVE tests have shown that pipe of Toncan Iron has a unique toughness that gives exceptional resistance to both shock and vibration. « Consequently Toncan Iron makes an ideal pipe for train service since it already possesses unusual resistance to corrosion. « Toncan Iron Pipe is uniformly fortified against the destructive attacks of rust and corrosion from one end of the pipe to the other, from the inside surface to the outside, throughout the shallow threaded section, at cut ends, at bends and through the couplings. « This modern pipe is an alloy of refined iron, copper and molybdenum. Throughout every stage of its manufacture it is processed to resist to a high degree the attacks of rust and corrosion. Consequently its life in severe service is longer and its cost per year of use is less. « In this age of waste elimination, Toncan Iron Pipe deserves full consideration.

REPUBLIC STEEL
CORPORATION
GENERAL OFFICES YOUNGSTOWN, OHIO

TONCAN
COPPER MO-LYB DEN-UM
IRON PIPE

ANNOUNCEMENT

The Electro-Motive Company and Winton Engine Corporation, both Divisions of General Motors Corporation, are being consolidated under the name of Winton Engine Corporation, effective as of January 1st, 1933, with Headquarters as before, at Cleveland, Ohio.

The consolidation of these two companies, which have always worked in close relationship, is intended to eliminate overlapping functions thereby effecting greater efficiency and economy.

The established policies of The Electro-Motive Co. will be continued and its Personnel will carry on the Rail Car and Locomotive activities in the Winton Engine Corporation.

THE ELECTRO-MOTIVE CO. WINTON ENGINE CORP.

Cleveland, Ohio
December 28 - 1932.

Universal Dry Lading Roof Economies Sum Up Like This

THIS roof consists of only 9 one-size, one-design parts and will fit all widths, all lengths, all designs of house cars on standard gage track. It is so adjustable that it does what it takes thousands of other roofs to do. It costs less to apply and practically nothing to maintain.

Its weatherproofing protects the lading against the elements and protects railroads against damage claims.

It does not require roofing boards. It allows free ventilation so that sweating is prevented in cars loaded with commodities that give off moisture.

Its weatherproof parts are made from spelter coated steel — the greatest protection against rust and deterioration.

It holds the car frame the most rigid and reduces the strain on the superstructure. The carlines, purlines, caps, saddles and flashings are rigidly secured to the car and to one another.

It does not require a big stock for maintenance and prevents delays to repairs.

And here is a splendid dollars and cents example of these economies. The maintenance on Dry Lading Roofs was only $4,519.49 for 18 years on 30,000 cars owned by the largest railroad in North America. Less than one cent per roof per year. Some record!

Hutchins Car Roofing Company

RAILWAY AGE

Government in Business – The Railroad Example

The period of prolonged, profound and ruinous depression which every one hopes, and apparently with good reason, is drawing toward a close, has, like similar periods in the past, called forth numerous clashing views regarding the causes of general prosperity and adversity. These conflicting views relate especially to the extent to which depression, losses of value and incomes, and unemployment are attributable to government activities, on the one hand, and to mistakes in business management, on the other hand. Some contend that we need more comprehensive economic planning, presumably by government officials, because only government, presumably, would have the power to make the planning effective. With government expenditures and taxation much larger in proportion to national income than ever before, and with government having been shown to be engaged in competition with some 250 different kinds of private business and professional activities, some contend that what is most needed is a reduction of government in business and of the taxation that it causes.

The railways are perhaps more involved than any other industry in this controversial storm. The main cause of the present plight of the railroads, some say, is that they have not been managed with foresight, initiative and ability. The main cause of their plight, others say, is that the regulation applied to them has lacked foresight and been excessively restrictive, while, at the same time, they have been subjected to the competition of other carriers that have been subsidized by the government and practically not regulated at all. Several things said by the Interstate Commerce Commission in its recent annual report show it realizes that this controversy regarding the causes of the present railway situation is of major importance and puts all government policies affecting the railways on the defensive. Let us briefly survey how the railway situation has been affected by government policies, first, from the standpoint of earnings, and, secondly, from the standpoint of operating expenses.

"Excess" Earnings with a $4,565,000,000 Deficiency

The Transportation act, which went into full effect in the latter part of 1920, assured the railways that the commission would give them opportunity to earn a fair return, and, at the same time, provided for recapture by the government of one-half of the excess over six per cent on a fair valuation earned by any railway in any year. In its opinion ordering a general reduction of freight rates in May, 1922, the commission held that an annual return of 5¾ per cent would be fair, and forecasted that the rates then fixed by it would enable the railways, under honest, efficient and economical management, to earn this return. On the commission's own basis of valuation the railways failed, in the 10 years ending with 1930, by $2,576,000,000 to earn the return forecasted by it.

In its recent annual report, however, the commission said: "Our estimates of recapturable excess income for the period 1920 to 1930, inclusive, amount to considerably over $300,000,000." In the 12 years ending with 1932 the railways failed by about $4,565,000,000 to earn what the commission held would be a fair return upon its own basis of valuation. It would have required $15,422,400,000 of net operating income to have produced an average annual return of 5¾ per cent during these 12 years upon the commission's own basis of valuation, while the total net operating income earned was only about $10,857,300,000, or at the average annual rate of about 4 per cent.

The reasons why the railways have failed by such an enormous amount to earn the return which Congress almost 13 years ago assured them they would be given opportunity to earn are various. The commission in 1922 and subsequently, as had been the case throughout the preceding decade, was influenced by a chronic disposition to be excessively optimistic regarding the prospective earnings of the railways, and persistently made forecasts that never were fulfilled. In its decision in 1911 in the first general advance rate case the commission based its forecast of earnings upon the return earned in 1910. That return never since has been equalled, excepting in 1916. In deciding the 15 per cent case in 1917 it said, in June of that year, "The general trend has been distinctly favorable," and "the general operating results, looked at in the large through a series of years, show, on the whole, substantial improvement." Not only were these statements not sup-

ported by the facts, but six months later the commission sent to Congress a special report saying that operating expenses were increasing so much that it could not make sufficient advances in rates to offset them. The general advance in rates authorized by it in 1920 failed from the start to produce the return that it anticipated. When it made a general reduction in 1922 it forecasted earnings that would produce an annual return of 5¾ per cent, which, as already shown, was not realized even in the immediately subsequent years, although they were years of record-breaking freight business; and during the latter years of the period 1922-1929 the commission's bad forecasting and the rate-making it based upon it were supplemented by increased water and highway competition, of which it long took almost no notice, as a cause of the declining tendency of railway earnings. The commission has shown a disposition to join those critics of the railways who within recent years, with great hindsight, have charged railway managements with having shown a lack of foresight. The commission has been in a better position than any other body or person to appraise trends in the entire railway industry; and having never made a correct forecast, based upon the trends prevailing, within twenty years it should modestly refrain from blaming others for lack of foresight.

Wages and the Railway Labor Act

At the beginning of the depression late in 1929, under the influence of President Hoover, the railways and other industries adopted the policy of maintaining wages in the face of declining earnings, and the railways continued to carry out this policy until late in 1931. Then, with most of the railways facing bankruptcy, they started to seek reductions of wages, but were confronted with the fact that strict conformity to the provisions of the Railway Labor act probably would delay a substantial reduction of wages for years. To avoid this delay an agreement was made with the railway labor unions for a reduction of 10 per cent for a year. Toward the end of 1932 the railways sought an agreement with the railway labor unions to extend the temporary reduction of wages and proceed, under the Railway Labor act, for a larger reduction. The outcome of the negotiations was an agreement under which the 10 per cent reduction will remain in effect until October 31, 1933, and the railways will be free to begin on June 15 a national negotiation with unions under the Railway Labor act for a larger reduction.

Here, then, we have three outstanding examples of government policies that have affected the railways both during the recent period of prosperity and during the present depression. First, their earnings were restricted by the Interstate Commerce Commission to less than a fair return for years when business conditions were such that, without burdening commerce, they could have charged rates that would have yielded more than 5¾ per cent annually. Secondly, there have been government subsidization and lack of regulation of competing carriers which have caused heavy losses of railway earnings. Third, because of President Hoover's policy of maintaining wages, and later because of the impracticability of getting prompt action under the Railway Labor act, railway wages were maintained at the highest level ever known during the depressed years 1930 and 1931, and on October 31, 1933, will have been maintained at 90 per cent of the highest level ever known for 21 months. These government influences are fully sufficient to explain why the railways within 12 years have failed by almost $4,600,000,000 to earn the return to which the Interstate Commerce Commission has held that they have been entitled under the provisions of the Transportation act.

What do these facts suggest regarding the duty of the national and state governments? The railroad problem is one of the most vital with which the American people are confronted. Railway managements and employees should do everything they can to help solve it; but they cannot solve it alone. For its solution it is essential that the national and state governments shall take prompt and constructive action.

Government Action Immediately Needed

Congress should repeal retroactively at its present session the recapture provisions of the Transportation act. What justice or common sense could there be in requiring part of the railways to pay over to the government more than $300,000,000 of so-called "excess" earnings when, within 12 years, the railways have failed by 15 times this amount to earn the "fair return" provided for in the same act which contains the recapture provisions, and when the government within a year has loaned them as much money to save them from general bankruptcy as the so-called "excess" earnings total? Second, the government, having gone as far as it has in loaning the railways money to protect investors in their bonds from huge losses, it should go still farther and so liberalize the law creating the Reconstruction Finance Corporation as to enable it to loan them enough more to help them to begin to get back on their feet, financially and physically. Third, Congress should at its present session pass legislation establishing parity of interstate regulation of the railways and competing carriers. Fourth, Congress at its present session should pass legislation retiring the federal government from the operation of barge lines in competition with the railways. Fifth, state legislatures at their 1933 sessions should adopt legislation which will withdraw subsidies from commercial highway carriers and subject them to state regulation comparable to that applied to the railways.

Under the terms of the agreement recently made by the railways and the labor unions there will be no unnecessary delays after June 15 in carrying to a conclusion proceedings under the Railway Labor act for a reduction of wages exceeding the temporary reduction now in effect. Excepting for this agreement it would be desirable to consider whether the Railway Labor act should not be greatly modified or entirely repealed. Like most laws for the regulation of industry, it seemed to work well enough under conditions of prosperity, but has threatened to be practically unworkable

in meeting the emergencies created by a depression.

This very incomplete review of railway history during the last 12 years certainly does not encourage the view that government interference in business helps business. In no other field has there been so much government in business, and in no other does experience afford so much support of the view that the more government there is in business the worse it will be for business and for all that great majority of the people who are dependent for their livelihood upon business. The only class of persons apparently benefited by most government interference in business are the taxeaters employed to do the interfering, and many of them probably would be better off in private business.

In spite of the views of some of the intelligensia and of taxeaters to the contrary, there never was a time when the slogan "Less government in business and more business in government" was more apropros than it is now. Never was there more evidence of the destructive economic effects produced by government interference with business, whether to restrict the earnings of some kinds of business or to subsidize other kinds. Never was so much evidence of these destructive economic effects afforded by any industry as is now afforded by the railroad industry, which has been the victim of more kinds of government interference than any other. It may seem inconsistent to decry so much government in the railroad business, and advocate more government in the trucking business. To advocate withdrawal of government subsidies from commercial transportation by highway is, however, to advocate less, not more, government in business. As to regulation—excepting that required to prevent unfair discriminations and promote public safety, the *Railway Age* will go as far as anybody in advocating freedom for the managements of *all* carriers, including railways, to manage their own business.

Motor Vehicle Restrictions

The railways' case with reference to competitive transport achieved welcome support in the report of the Special Committee on Competing Forms of Transportation of the Chamber of Commerce of the United States, an abstract of which was published in last week's *Railway Age*. This report, in the main, supports most of the railways' contentions as to the injustice of their competitive situation and recommends legislation to correct many of the inequalities under which they now suffer. Railroad men who discuss transportation problems either in public or private will find a study of these recommendations most helpful.

In one important respect, however, the report is disappointing—that is in its recommendation that "there should be standard uniform requirements in all states as to allowable height, width and length of single and combined units, axle and wheel loads and speeds as recommended by the American Association of State Highway Officials." From this recommendation, the two railroad executives, members of the committee, much to their credit, dissented.

We do not wish to criticise the other members of the committee, however, for adopting this recommendation. When technical questions arise it is only natural to turn to presumably impartial governmental authority for guidance. The fault, if there be such, arises when the governmental data thus supplied lack the impartiality which they should have, and rests squarely upon the shoulders of those who promulgate them in the name of authority.

The *Railway Age* last April called attention to the utterly one-sided views on commercial motor vehicle taxation which were being advanced by Thomas H. MacDonald, chief of the United States Bureau of Public Roads. What, one may ask, may this have to do with recommendations as to allowable sizes and weights by the American Association of State Highway Officials? Simply this: These proposed standards are substantially those put forward by Mr. MacDonald in his testimony before the Senate Committee on Interstate Commerce last March at the same time that he advanced his fantastic ideas on what fair charges for commercial use of the highways should be. That his views on reasonable weight and size restrictions, for which he has succeeded in securing the sponsorship of the American Association of State Highway Officials, are no more to be accepted at face value than his ideas of adequate fees for commercial use of the highways, may be deduced by comparing them with the standards adopted in Kentucky, one of the most recent states to legislate upon this subject.

Limitations on Commercial Motor Vehicles

	MacDonald Recommendations to Senate Committee	Recommendations of Assn. of State Highway Officials	Kentucky Standards
Max. Wheel Load High-Pressure Tires.	8,000 lb.	8,000 lb.[1]	Gross weight on all wheels not to exceed 18,000 lb.
Max. Wheel Load Balloon Tires.....	9,000 lb.	9,000 lb.[2]	
Max. Axle Load High-Pressure Tires.	16,000 lb.	16,000 lb.[1]	
Max. Axle Load Balloon Tires.....	18,000 lb.	....	
Max. Width	96 in.	96 in.	96 in.
Max. Height	....	12½ ft.	11½ ft.
Max. Length (single vehicle)	35 ft.	35 ft.	26½ ft.
Max. Length (Comb. of Vehicles).	....	45 ft.	30 ft.[4]
Full Trailers Allowed..	....	One	None
Max. Speed	45 m.p.h.	45 m.p.h.	30 m.p.h.[5]
Max. Gross Weight (Vehicle or Comb.)..	....	28 tons[3]	9 tons

[1] This loading is permitted for solid tires also, but in such cases, speed is restricted to 10 m.p.h.
[2] Says such weight will not increase slab stress.
[3] Calculated by the formula: Not less than 700 X (distance, in feet, between first and last axles of combination plus 40). A combination with axles 40 ft. apart, therefore, could weigh 56,000 lb. or 28 tons gross.
[4] Tractor and semi-trailer.
[5] Vehicles over 2½ tons gross weight.

The parallel between Mr. MacDonald's recommendations and those adopted by the American Association of State Highway Officials is too close to require comment. The discrepancy between them and those of a state which has recently made a serious attempt to legislate to save the roads it already has, and to reduce the costs of those it builds in future, however, certainly casts a grave doubt on their adequacy to provide any real protection to the highways and the general taxpayers who, to a large degree, build and maintain them.

A Million a Day for Supplies in 1932

Heavier buying since June—Millions required to catch up on deferred maintenance

THE railroads of the United States spent approximately $442,000,000 for fuel and other supplies in 1932, according to estimates made by the *Railway Age* on the basis of reports for the first 10 months of the year from railroads earning 87 per cent of the revenues. These purchases exclude expenditures for locomotives and cars, for contract work, and for heat, light, power, rent and other miscellaneous services; also purchases made in the United States by roads operating in Canada and Mexico. The purchases of fuel and supplies last year were approximately $250,000,000, or 35 per cent, less than the expenditures in 1931; approximately $600,000,000, or 57 per cent, less than in 1930; approximately $885,000,000, or 67 per cent, under 1929; and approximately $935,000,000, or 69 per cent, under the average per year for the five years 1925 to 1929, inclusive. At the same time, they were equivalent to an expenditure of considerably more than a million dollars a day by the railroads in the markets of the country during 1932.

With records of the expenditures made for fuel, for ties, for rails and other materials during the first 10 months of 1932, from roads with more than 80 per cent of the revenues, and more detailed divisions of the purchases from a smaller number of roads for the same period, it has been estimated that the aggregate expenditures made during 1932 included approximately $149,500,000 for coal, $31,000,000 for fuel oil, $52,000,000 for forest products, and $117,650,000, for iron and steel products, including $17,500,000 for rail, $9,500,000 for track fastenings, $7,600,000 for signal and interlocking material, $12,400,000 for locomotive and car castings and $17,500,000 for wheels, tires and axles, while approximately $8,600,000 was spent for non-ferrous metals, $13,200,000 for lubricating and illuminating oils, $11,800,000 for stationery and approximately $7,200,000 for train and station supplies. Other divisions are shown elsewhere.

The expenditures represent declines in all purchases but especially in the purchase of materials required for general repair and improvement of railway facilities, with the result that expenditures for supplies which are completely consumed as purchased represented a much larger proportion of total purchases in 1932 than previously. Fuel purchases were almost as great in 1932 as the total amount spent for other materials, whereas these latter usually total more than double the fuel purchases.

Purchases Show Gains

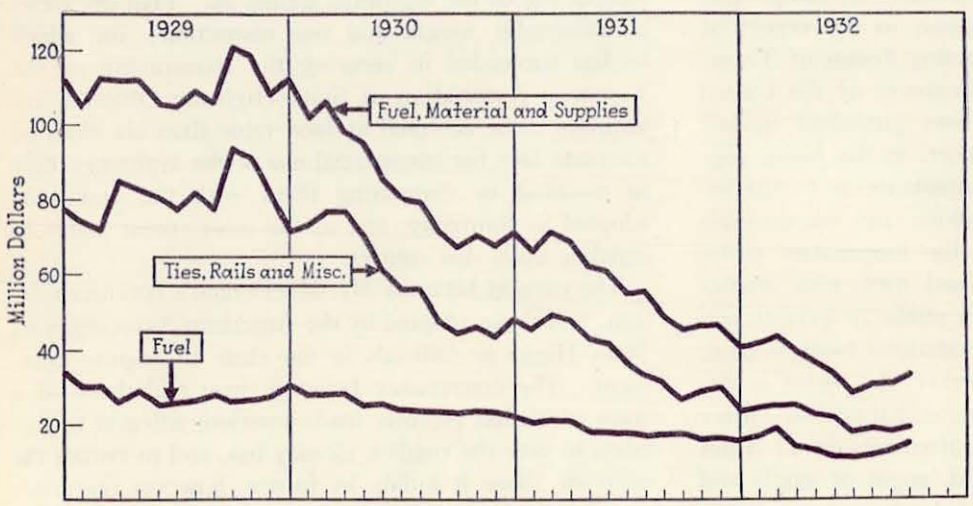
The approximate amount of fuel, rails, ties and miscellaneous materials purchased during each of the first 10 months of 1932 are shown in tabular form, and the trend of fuel and other purchases by months since January, 1929, are charted. While the majority of the roads continued to make reductions in 1932 beyond the reductions made in previous years and a few continued reducing their purchases through October, purchases in the aggregate appear to have definitely reached their lowest point in July. In July, 1932, total purchases were 31.5 per cent below the expenditures made in January, 1932. In August, they were 22.2 per cent; in September, 21.5 per cent; and in October, only 16.5 per cent below January. This was equivalent to a gain in four months of $11,000,000. Increased purchases of fuel were a factor in this increase, but increased expenditures were also made for miscellaneous supplies.

Railway Purchases—10 Months 1932*

	Fuel	Ties	Rail	Other Material	Total
January	$16,800,000	$2,600,000	$1,500,000	$19,300,000	$40,200,000
February	17,300,000	2,600,000	3,650,000	18,650,000	42,200,000
March	19,000,000	4,100,000	2,000,000	19,700,000	44,800,000
April	14,400,000	4,300,000	2,200,000	19,100,000	40,000,000
May	13,600,000	3,500,000	1,950,000	18,000,000	37,050,000
June	11,600,000	3,700,000	1,000,000	17,700,000	34,000,000
July	11,100,000	2,200,000	300,000	15,000,000	28,600,000
August	12,100,000	2,100,000	1,400,000	15,900,000	31,500,000
September	13,100,000	2,700,000	750,000	15,200,000	31,750,000
October	15,000,000	1,650,000	1,300,000	15,650,000	33,600,000
	$144,000,000	$29,450,000	$16,050,000	$174,200,000	$363,700,000

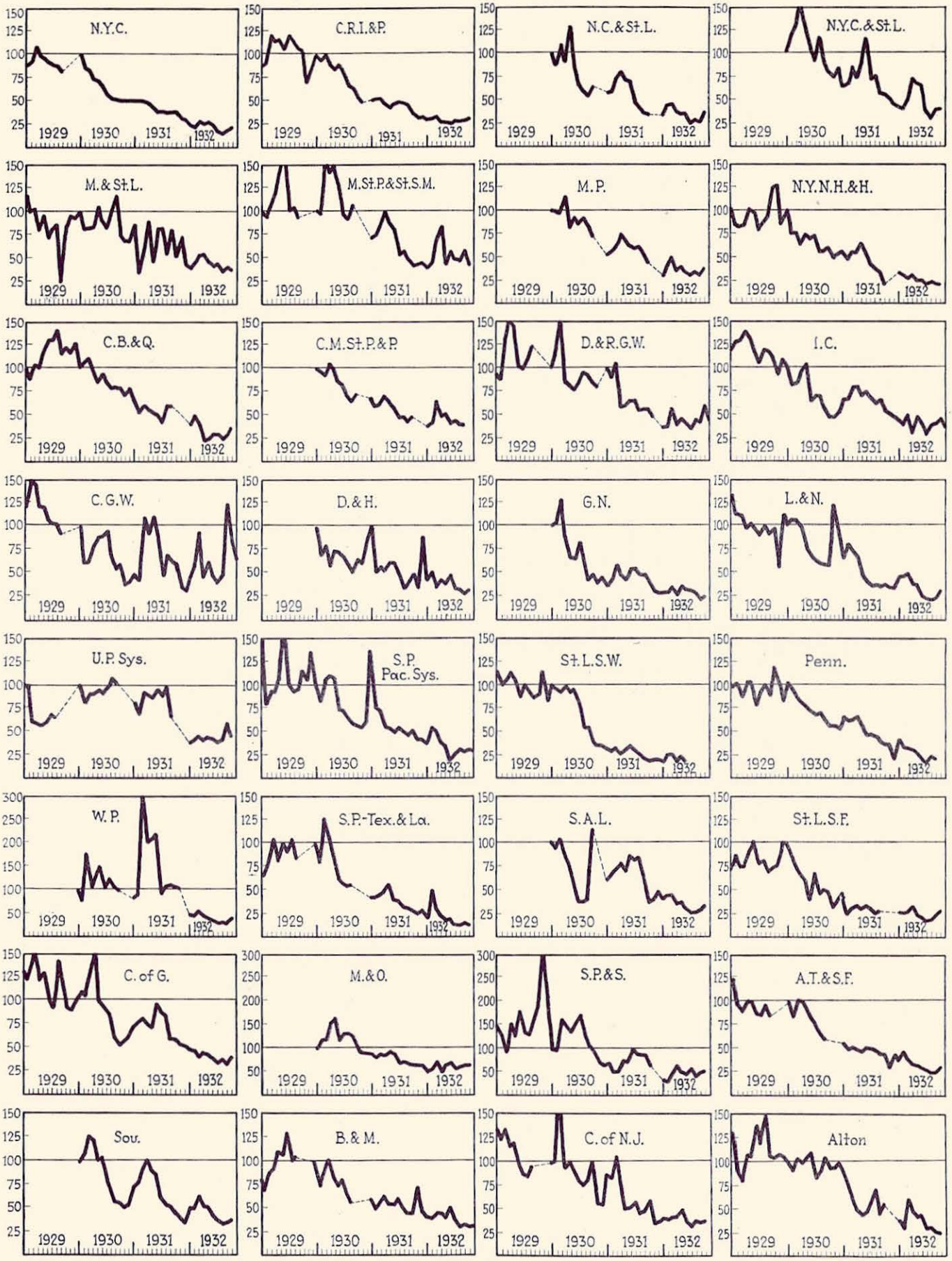
* Subject to revision.

Purchases did not reach the low mark on all roads in the same month, but gains were general. The Santa Fe spent $190,000, or 11 per cent, more in October than

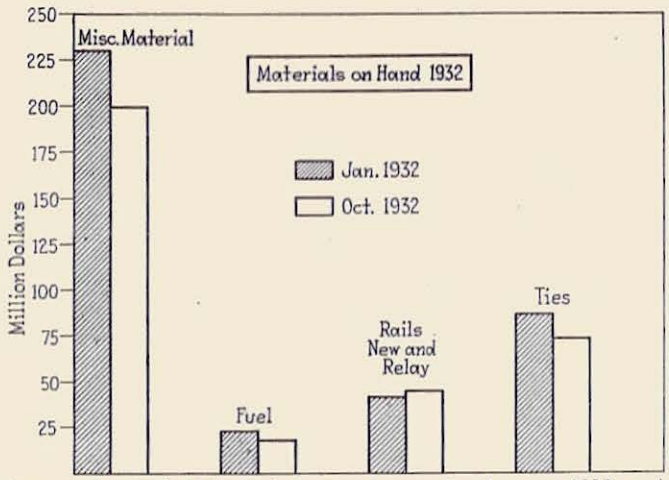


Railway Purchases by Months, January, 1929, to October, 1932

during its lowest month. There was a gain of $98,000, or 15.5 per cent, on the B. & A.; $124,000, or 15 per cent, on the C. of N. J.; $541,000, or 18 per cent, on the C. & N. W.; $255,000, or 14 per cent, on the C. B. & Q.; $178,000, or 22 per cent, on the C. G. W.; $139,000, or 11 per cent, on the D. & R. G. W.; $117,000, or 12 per



Trends of Purchases of Representative Railroads by Months—Purchases in January, 1930, Taken as 100



Comparative Book Values of Railway Inventories, January, 1932, and October, 1932

cent, on the Erie; $488,000, or 16 per cent, on the I. C.; $188,000, or 14 per cent, on the L. & N.; $965,000, or 15 per cent, on the N. Y. C.; $420,000, or 17 per cent, on the S. P.; and $233,000, or 11.5 per cent, on the U. P. These and other gains reflect the increasing pressure for repair work on the railroads and the responsiveness of the companies to improvements in their revenues.

Deferred Purchases Pile Up

Ordinarily, railway purchases are closely related to revenues and tonnage, even though wear and tear is but one factor involved in the replacement of materials. The relation of purchases to revenues and tonnage is usually so constant as to be often employed to indicate what railroads should spend for new materials. Since 1929, however, railway purchases have declined at a faster rate than either railway revenues or gross ton-miles. From January, 1930, operating revenues declined almost constantly to July, 1932, when they were only about 52 per cent of the values of January, 1930. During the same period, gross ton-miles declined to about 59 per cent. In July, 1932, purchases of materials and supplies, exclusive of fuel, were only 23 per cent of the purchases in January, 1930, a difference between the rate of decline in business and purchases which can be explained only in part by reductions in the prices at which materials could be bought and the longer life of some materials.

In comparison with operating revenues, the purchases declined from an average of approximately 15.5 per cent of operating revenues during 1929 to 7.3 per cent of operating revenues in July, 1932. If it can be assumed that the railways should have continued to make purchases equal to about 15.5 per cent of their operating revenues throughout the depression in order to have maintained their facilities in a good state of repair and carried out the ordinary improvements required to overcome current obsolescence, it may be deduced from the relation between the purchases and revenues each month since 1929 that, subject only to adjustments for changes in prices, the railroads have fallen behind in their purchases of supplies to the extent of about $450,000,000.

Purchases of Class I Roads of the United States—1932*

Item:	
Fuel:	
Coal	$149,500,000
Fuel oil	31,000,000
Other fuel	2,500,000
Total fuel	$184,500,000
Forest Product	
Cross ties	$30,500,000
Switch and bridge ties	3,500,000
Lumber and timber	16,500,000
Other material	1,500,000
Total forest products	$52,000,000
Iron and Steel Products:	
Steel rail	$17,500,000
Rail, fastenings and parts	9,500,000
Telegraph, telephone, signal and interlocking material	7,600,000
Bolts, rivets, washers, etc.	3,750,000
Pipe and fittings	2,150,000
Locomotive and car springs	1,650,000
Bar and sheet steel	4,800,000
Locomotive and car forgings	2,300,000
Locomotive and car castings	12,400,000
Boiler tubes	1,600,000
Air-brake material	1,800,000
Locomotive appliances	2,300,000
Wheels, tires and axles	17,500,000
Machinery, tools, boilers and other iron and steel	32,800,000
Total iron and steel products	$117,650,000
Miscellaneous:	
Castings and tubing of brass and alloys	$8,600,000
Miscellaneous electrical supplies	5,300,000
Cement and other building materials	4,250,000
Nails, hand tools and hardware	3,300,000
Rubber and leather goods	3,100,000
Glass, paint supplies, chemicals, etc.	12,300,000
Lubricating and illuminating oils, etc.	13,200,000
Foundry supplies	1,750,000
Wood preservatives	3,500,000
Ballast	4,650,000
Track tools and motor-car parts, etc.	3,100,000
Dining-car supplies	7,850,000
Stationery and printing	11,800,000
Locomotive and train supplies and miscellaneous	7,200,000
Total miscellaneous	$89,900,000
Grand total	$441,550,000

* Estimated on the basis of reports for the first 10 months—Subject to revision.

Rate of Change in Railway Operating Revenues, Gross Ton-Miles and Railway Purchases from January, 1929, to October, 1932, Showing a More Rapid Decline in Railway Purchases than in Railway Business

Railway purchases are influenced by the volume of unused materials on the railroads and by material awaiting repair.

The material and supply balance of the Class I railroads at the beginning of last year, as reported by the Interstate Commerce Commission, was $374,300,000. Based on the reports received by the *Railway Age*, this inventory included approximately $21,200,000 in fuel stocks, $87,700,000 in tie stocks, $40,500,000 in stocks of new and relay rail, and $225,000,000 in general materials, including scrap. On this same basis, the values of materials and supplies on hand at the end of October

Divisions of Materials on Hand—Estimated

	Fuel	Ties	Rail	Other Material	Total
January ...	$21,200,000	$87,700,000	$40,500,000	$225,000,000	$374,400,000
October ...	18,200,000	73,000,000	44,000,000	199,200,000	334,400,000
Reduction .	$3,000,000	$14,700,000	$+3,500,000	$25,800,000	$40,000,000

were approximately $334,200,000, consisting of approximately $18,200,000 for fuel, $73,000,000 for ties, $44,000,000 for new and relay rail, and $199,200,000 for miscellaneous materials. This was a reduction of approximately $3,000,000, or 13 per cent, in the book values of fuel on hand, $14,700,000, or 16 per cent, in the book value of ties on hand, an increase of approximately $3,500,000, or 9 per cent, in rail stocks, and a reduction of approximately $25,800,000, or 11 per cent, in miscellaneous materials, or an aggregate net reduction of $40,200,000, or 11 per cent, in total inventories. Monthly reports from the railroads showed a steady decline throughout the year, or at least since last March, in the stocks of fuel, ties and miscellaneous materials, and these reductions continued through August, September and October, when purchases showed increases.

American Airways carried 50 per cent more passengers in November, 1932, than were carried over the system in November, 1931, L. D. Seymour, president, has announced. Revenue miles flown for the same period showed an increase of 24 per cent, with total mileage flown of 917,177. Air express showed an increase of 700 per cent, comparing November this year against the same month of the previous year.

Freight Car Loading

Washington, D. C.

Revenue freight car loading in the week ended December 24 amounted to 494,580 cars, a decrease of 22,216 cars as compared with the preceding week. This was an increase of 53,681 cars as compared with the total for the corresponding week of 1931 and a reduction of 41,712 cars as compared with 1930 but the corresponding weeks of the past two years included the Christmas holiday. For this reason there were increases over the totals for 1931 in the loading of grain, livestock, coal and coke. Loading of forest products also showed an increase as compared with the preceding week, but all other commodity classifications showed reductions. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

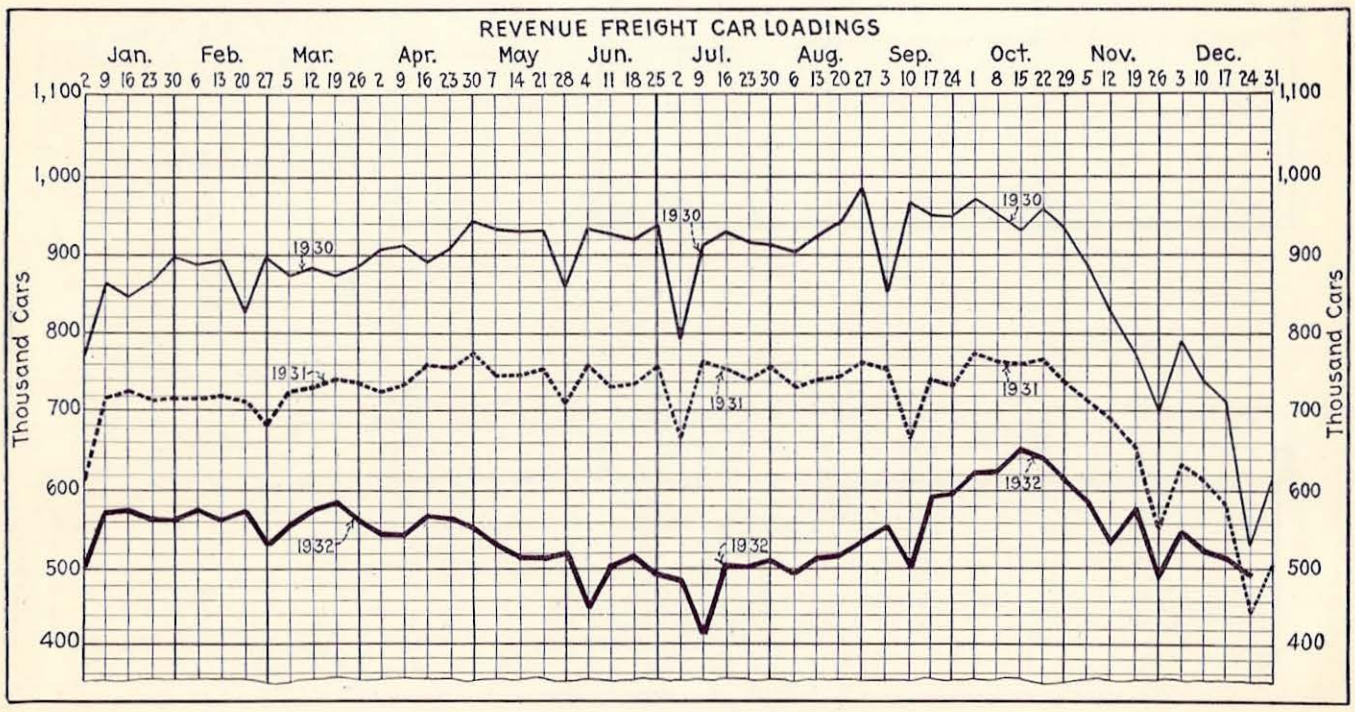
Revenue Freight Car Loading

Week ended Saturday, December 24, 1932

Districts	1932	1931	1930
Eastern	118,540	99,590	121,878
Allegheny	96,823	91,223	108,026
Pocahontas	38,433	26,642	28,175
Southern	75,065	64,673	78,191
Northwestern	55,462	49,088	63,475
Central Western	70,011	69,208	90,093
Southwestern	40,246	40,475	46,454
Total Western Districts	165,719	158,771	200,022
Total All Roads	494,580	440,899	536,292
Commodities			
Grain and Grain Products	25,370	20,514	26,667
Live Stock	14,264	13,431	17,625
Coal	140,836	89,644	117,457
Coke	6,609	4,361	7,638
Forest Products	12,656	13,690	20,695
Ore	1,903	3,605	4,281
Mdse. L. C. L.	154,613	150,441	166,731
Miscellaneous	138,329	145,213	175,198
December 24	494,580	440,899	536,292
December 17	516,796	581,170	713,865
December 10	521,216	613,621	744,353
December 3	547,461	636,366	787,072
November 26	493,882	558,798	701,050
Cumulative total, 51 weeks	27,788,049	36,648,522	45,102,219

Car Loading in Canada

Car loadings in Canada for the week ended December 24 amounted to 31,763 cars, a decrease from the previous week's loadings of 4,731 cars. The large decreases were



in grain, 1,138 cars; coal, 1,296 cars; merchandise, 949 cars, and miscellaneous freight, 780 cars. All other commodities except pulp-wood and ore also showed small decreases and the index number dropped from 58.73 to 55.08.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
December 24, 1932	31,763	17,339
December 17, 1932	36,494	17,697
December 10, 1932	38,004	17,547
December 19, 1931	42,778	21,581
Cumulative Totals for Canada:		
December 24, 1932	2,148,016	958,964
December 19, 1931	2,544,061	1,264,459
December 20, 1930	3,111,192	1,675,439

Metal Roof for Open-Top Cars

MANY commodities, such as powdered chemicals, cement, small grains, etc., now transported in box cars with considerable attendant expense for loading and unloading, can, in certain instances, be handled more economically in open-top cars, provided some method is devised for protecting the loads under adverse weather conditions. To meet this need, the Union Railway Equipment Company, Chicago, has recently developed the "Alar" metal roof, so designed that it may be applied to hopper or gondola cars now in service. The ends of the car are built up slightly, and two substantial structural steel channels applied to support a running board along the center line of the car. Beneath these channels, and supporting them, are two carlines extending from side to side of the car and riveted to the center channels.

The roof is thus divided into two sections, one on either side of the running board, and each having its individual operating mechanism for raising and lowering. By reference to the drawing, it will be observed that there is a wheel on the end of the car on the opposite side from the brake wheel which operates a power unit composed of a series of gears which in turn rotate the operating rod extending from end to end of the car.

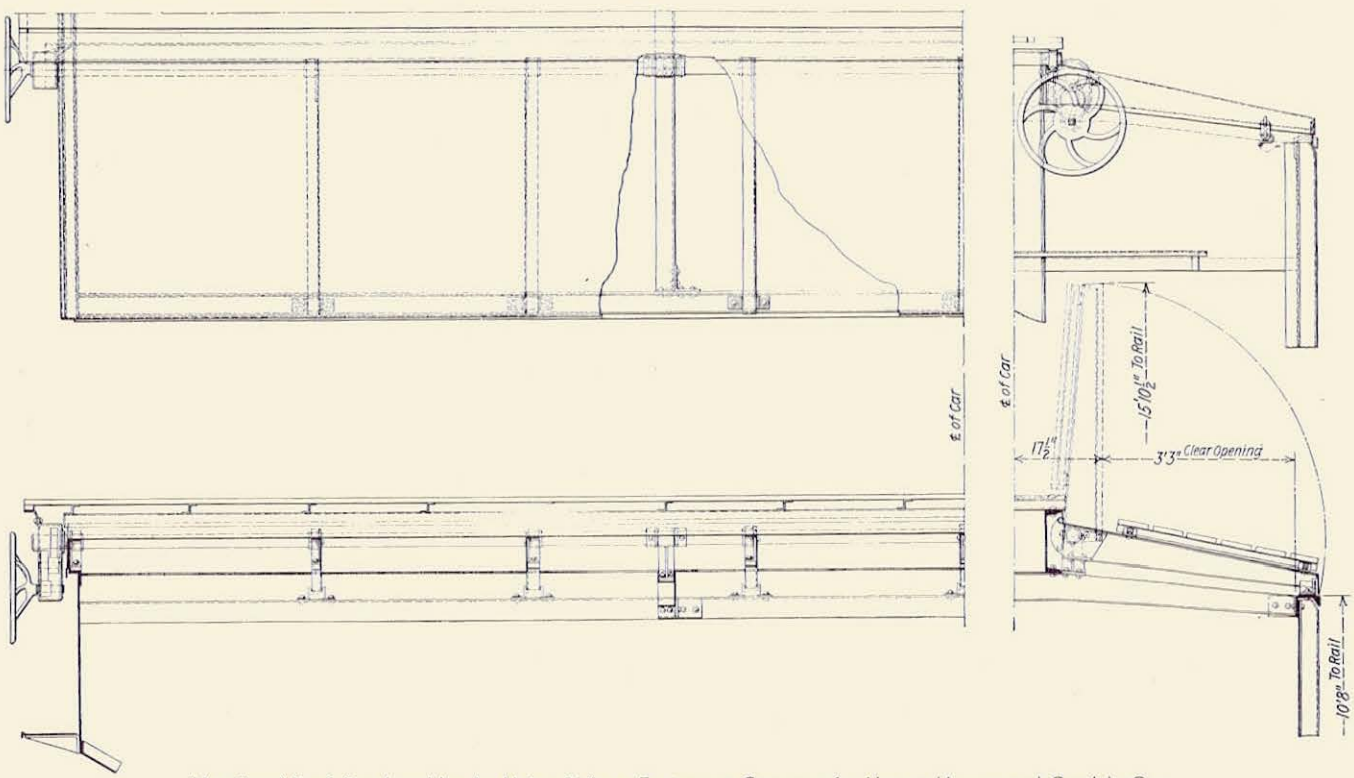
To this rod are secured the arms or wings supporting the roof sheets, and these arms rest at the outer side of the roof in pocket castings designed to prevent any shifting in the roof at that point. The operating rod is secured not only to the ends of the car, but also at intermediate points, by means of brackets on the carlines. A few turns of the hand wheel will raise the roof on that side of the car to a vertical position at right angles with the running board and provide an open space of approximately 3½ ft. in width, the full length of the car, for loading purposes.

Each side of the roof relative to the running board is operated independently. A ratchet and pawl are also provided to retain the roof in the raised position. A steel hasp and hook is provided at each end of the car on either side for sealing the roof in the closed position.

The roof sheets are formed at the running board, at the eaves and at the ends of the car, to prevent moisture or foreign particles getting into the interior of the car. At each end of the car a vertical channel is applied to which the longitudinal channels, as well as the housing for the operating mechanism, are riveted.

Railroads experience considerable losses, due to the pilfering of coal or other commodities loaded in open-top hopper cars, and considerable labor expense is involved during winter in unloading materials which are exposed to the weather. The new "Alar" metal roof is designed to meet these conditions by preventing losses and effecting economies in loading and unloading.

IMPROVED RAILWAY SERVICE IN THE FAR EAST is foreshadowed, according to Commerce Department reports, by announcements of faster passenger schedules on a number of Chinese and Manchurian railways, and by tentative plans of the Japanese Railway Ministry for inauguration of through traffic arrangements between Japan and all Manchurian railway lines.



Alar Metal Roof Developed by the Union Railway Equipment Company for Use on Hopper and Gondola Cars

Specialization and the Railroads

Many roads are being led further into manufacturing fields than is good either for them or for the country

By R. D. Bartlett

IN the mind of the transportation executive, there should be no doubt as to the importance of specialization to national welfare, and to his industry in particular. American railroad transportation was the parent of American specialization. It made specialization economically possible. And specialization has become one of the main supports of its railroad parent.

Analyze the sources of transportation revenue. You will find commodities, without end, shipped from native sources to distant points for conversion by specialists, for assembly by specialists, for processing or finishing by specialists, or mere accumulation by specialists; after which, they are re-shipped, perhaps several times, a large part eventually returning to the section from which they originated. An appreciable portion of the savings of specialists is expended in railway transportation. It is a substantial part of railway revenue. The fact that we are a nation of specialists, creates additional demands for railroad transportation, and thus swells the total revenue collected by the carriers.

But, what about the railroads? Transportation is their specialty. The railroad business is an enormous and intricate activity. In involves the purchase and use of innumerable materials and commodities. If the railroad industry were to overstep the frontiers of its specialty, it might well delve into real estate, rolling mills, steel fabrication, foundries, telephones, printing, lumbering, hotels, restaurants, ice, heat, light and power, locomotive and car manufacture and a host of lesser activities.

Railroads Being Led Away From Their Specialty

By and large, in the ante bellum past, the railroads wisely avoided excursions into other fields. But, in recent years, a combination of influences has led them away from their specialty and further into manufacturing fields than is good for either the country or themselves.

Over this period, many railroads acquired property, built shops and enlarged others in what was undoubtedly an honest belief that these additions were necessary to the efficient operation of their properties. In doing so, they extensively duplicated facilities owned and efficiently operated by manufacturing specialists. In doing so, they duplicated facilities which were ample for the country's needs of that nature. They duplicated facilities of an industry particularly sympathetic and friendly to them, a specialized industry which had been rendering efficient and reasonably priced service. No certificate of public convenience and necessity was required for this expansion.

Supposedly, these surplus railroad shop facilities were acquired for maintenance of equipment. This was the subtle wedge. However, it turned out to be not merely the emergency and routine maintenance which is a necessary adjunct of transportation. It put the railroads in the field of heavy equipment reconstruction and betterment, which is not distinguishable in any important particular from new manufacture.

From this point, it was but a step to the actual building of new equipment—a step to the addition of auxiliary facilities and machinery for making castings, forgings, pressings, bolts, nuts, rivets, wheels and many other parts, tools and commodities. At the time of our financial debacle, the railroads were performing, annually, millions of dollars worth of manufacture which they had arbitrarily taken away from specialized manufacturers—millions of dollars worth of business which they had arbitrarily diverted from those who had earned it through years of hard labor and good management.

This new railway sideline did not have to compete for its business. It did not have to account for its costs. The "ipse dixit" of the paternal organization insured it a lion's share of the work. Its gross expenses were currently paid out of transportation revenue collected from the public. The railroads had subsidized a protected industry to supplant one which had grown up under open competitive conditions.

Easy to Expand Manufacturing Activities Once Started

Once in this field, every influence close to the railroad executive urges him to remain there and even to go further along the path. Communities which have tasted the flavor of a large shop pay-roll and additional tax income, are loath to let these benefits diminish or disappear. Just as in the case of government army posts, navy yards and post-offices, every locality about to lose its "bit of pork" gets busy when retrenchments are proposed, similarly, the labor organizations, representing these surplus employees, are all for putting the railroads into as much manufacture as possible. Why not? Their value to their membership, their ability to draft public support, increases with the immediate power which they wield. Railroad manufacturing will eventually give them greatly-augmented power over this particular employer. The instincts of the railroad manager should operate to drive him away from all manufacture, as keenly and unerringly as the labor official's instincts operate to force him into it.

Permanence of railway employment does not necessarily contemplate subsidies or doles. It can and does contemplate revamping conditions to eliminate peaks and valleys of employment. The obligation to stabilize employment attaches to all business, but it is bound to attach itself with greater hold to the railroads. They are the employers of one of the largest bodies of industrial labor. Governmental control makes them naturally and more easily the first subjects for exposition of this increasingly popular idea.

The accomplishment of reasonable permanence of employment, for classes of labor essentially of a transportation nature, is a considerable problem. Permanence of employment for railway manufacturing labor is practically impossible without enormous subsidies to maintain it. Accumulating an unnecessary organization, in a field foreign to transportation, a field of widely fluctuating demand, is building up an impossible situation and flying in the face of popular thought. If a railroad desires to meet the growing state of mind, rather than be overtaken by it, there is only one method of making

headway in the stabilization of shop labor. Cut out such part of the shop activities as are the most fluctuating. Operate with the minimum force and facilities necessary to emergency and routine maintenance. Then there will be no peaks to create later an unemployment problem in the shop department.

How to Detect Haphazard and Wasteful Manufacturing Practices

If there is a railroad executive who doubts the fact that the manufacturing activities of his company are haphazard and wasteful, let him call upon his own organization for the cost of performance in these lines. Then, let him turn those cost figures over to an independent accountant, experienced in manufacture, for criticism. He will find that the very nature of his governmentally-dicated transportation accounts makes it difficult for him to get an accurate cost statement from his records. Railroad accounts are not set up for that purpose. They are set up to reflect transportation costs and results. They serve but to obscure manufacturing costs. Moreover, the executive cannot readily, by means of special analyses, have them interpreted, split and recombined to show a true record of expense in any manufacturing activity. Accounting systems are specialists, too. They cannot function efficiently outside of the field for which they were developed.

If this does not convince the railway executive that he has been running this division of his business blindly, let him go back a few years to the cost reports of which his shops were so proud. Let him add to these reported costs the inescapable burdens which have been borne in the last three difficult years, during which there was little work, and less cash, to keep up production. It will change the aspect of those old cost figures materially.

These expositions of slow cost-returns and obscure accounts should convince the executive that he has not had his finger on the real pulse of his shop activities. They should convince him that neither his supply of time, his training nor the accounting aids available, are likely to permit his ever getting in touch with them. Who, then, is there managing this highly-specialized activity? His shop officials? Let him consider them, coldly, without prejudice or favor; not as men, but as production managers.

Whence do they come? From manufacturing concerns where they have made good reputations as manufacturers? Not at all. They come mainly from the ranks of transportation. They do not and never have had to keep within cost limits on any particular problem of production. Theirs has been a job, primarily, of spending part of the money turned in by a giant transportation machine; not a job of making a profit or controlling the cost on any item. Theirs is not, generally speaking, a job of competing for work through quality production and the exercise of economy. So far as quality goes, they, themselves, are the judges of the quality of their own product. They have no more access to accurate cost information and comparison than has the executive. Very rarely do you hear of a railroad shop man being drafted to supervise private manufacture. Their training is not such as to qualify them. This is not just chance. There is something to be learned from it. But, this is the man apparently believed by his superiors to be the "boss" manufacturer of them all.

This shop man's best opportunity for the future is to expand his own department; to increase its activities and personnel to a point where the situation will warrant paying the department heads higher rates of compensation. This is not a comment on railroad men. It is a comment on human nature. Self-interest functions in all of us. It functions, frequently, when we, ourselves, do not realize exactly what impels us.

Unless the executive has a thorough appreciation of the danger of straying from his specialized field, he follows the suggestion to expand shop activities, he believes the estimates of cost, he shuts his ears to outside protest, and later discovers himself in troubles, from which it is hard to extricate him. He has saved nothing. He has wasted capital which will be needed for other uses in the future. He has unnecessarily multiplied his labor troubles. He has placed greater power in the hands of an already-overpowered governmental agency. He has shouldered upon his company the unwritten, but none the less onerous, obligation to provide work for a large, highly-paid organization when conditions may demand that he dispense with it.

Railroad-Supported Subsidies Are Socialistic in Effect

Today, the government is being importuned to exercise its control in favor of railway workmen in conflict with their employers over wage matters. Today, the carriers are asking, and the government is granting, credits known as "work loans," a large part of which are being used in the payment of shop wages to a group of employees who were unnecessarily adopted into the railroad family.

The socialistic aspect of a railroad-supported subsidy is as serious, under such conditions, as a direct government subsidy. And these conditions are not likely to change. While the present reaction may result in some easing of regulatory fetters, it is unlikely, in the present state of public mind, that there will be any surrender of the control which is gradually being usurped in the matter of railway wages and permanence of railway employment.

The railroads have many enthusiastic and active supporters in their current plea for equality of opportunity, for more reasonable regulation, for less subsidized competition. But, some of these same champions draw convincing parallels, in their own fields, and look to the railroads to right economic wrong wherever they, themselves, have been the economic offenders.

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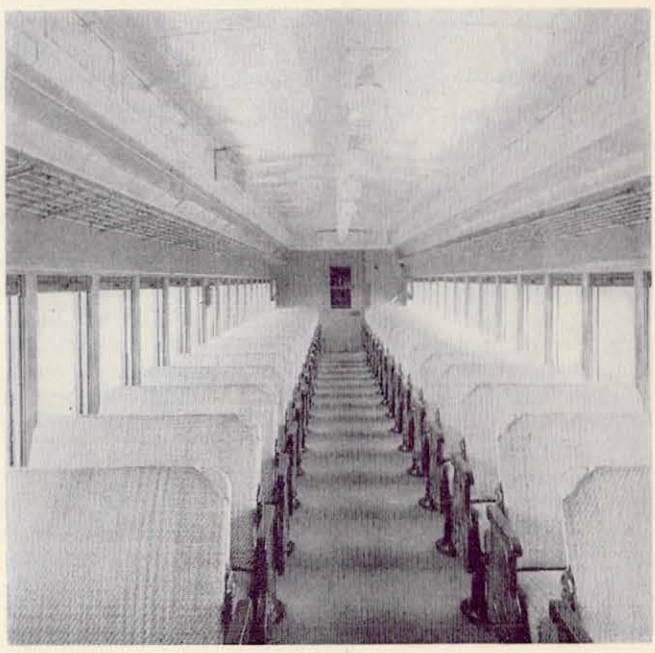
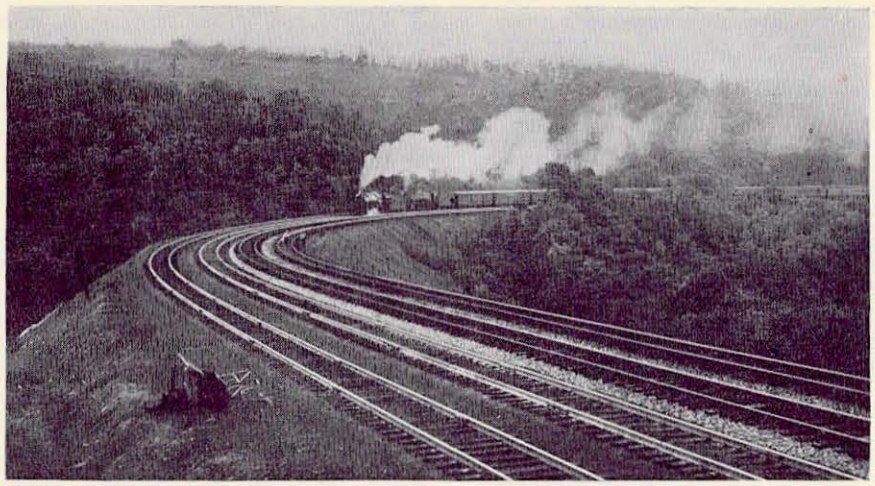


A Delaware, Lackawanna & Western Coach, Built by Pullman for Electrified Suburban Passenger Service



Curves, Grades and Heavy Traffic Make the Line Over the Alleghany Mountains an Excellent Proving Grounds

Are the Railways Backward in Research and Test Work?

The answer is emphatically "no" on many roads—Pennsylvania's maintenance of way department testing a good example

BECAUSE of the very nature of the railway industry, with its tracks, shops, and testing facilities scattered throughout the country and generally inaccessible to the public, few persons, even among railway employees, appreciate the extent to which the railways engage in research, investigations and tests in the interest of greater safety, increased efficiency of operation and reduced costs. The fact remains, however, that the railways, individually and collectively, have carried on this class of work with increased interest and energy, entirely auxiliary to their main function of providing transportation, until in recent years they have been spending millions of dollars annually in such activities, directly and indirectly.

Coupled with the efforts of the railways is the extensive research work of the railway supply industry, which, year after year has been extended as the service demands of the roads have increased and the physical demands upon their tracks and rolling stock have been enlarged. Thus we have both the producing and the consuming interests of the railway industry joining in research and test work, and to an extent which is surpassed by few other industries in the country.

As a Consuming Industry, Railways Lead

As a consuming industry, it is not entirely fair to compare the research facilities of the railways with those of large producing industries. Such industries correspond more closely with the railway supply industry, to whom the railways look logically for constant advancement in the design and efficiency of the materials, equipment and supplies which they buy. However, recognizing that the greatest advancement in the art of rail transportation is not possible without fullest co-operation with the railway supply industry, and furthermore, that many service investigations and tests are of a nature which cannot be carried out by that industry, the railways have been extending this co-operation to an ever increasing extent. In fact, the railways, through their own research and test work have, in most cases, set the standards for the supply industry. This is well known to the manufacturers of railway materials and supplies, who, in spite of the extensive research in their own plants to produce products of the highest quality, are ever confronted with the specifications of the individual roads, born of study and research, and, in most cases, years of actual tests and experience.

Evidence of the extent and effectiveness of the research and test work done by the railways is reflected unmistakably on every hand, whether it be in the remarkably improved safety records of the roads, their increased efficiency and dependability, their reduced operating costs, or in the favorable condition of their physical properties at the present time in spite of the drastic curtailment in their expenditures for equipment, materials and labor, which has been necessary during the last two or three years.

Pennsylvania a Good Example

Among the larger roads, the Pennsylvania offers a good example of the extent of the research and test work which is being done by individual roads, and reference to the work of this road is particularly appropriate because of the reorganization of investigation and testing methods which has taken place in its maintenance of way department during the last four years, for the sole purpose of increasing the accuracy and value of the results secured.

The Pennsylvania concentrates its research and test work at Altoona, Pa., the location of its principal car and locomotive shops, where it maintains a large laboratory fully equipped with physical, chemical and electrical testing equipment. At this point it undertakes thousands of tests and examinations each year, working constantly to improve the quality and efficiency of all classes of materials and products used in the rail trans-

An Inspection of Some of the Field Test Installations

portation industry. Few products purchased and used are too small or inexpensive to escape the scrutinizing eye of the testing laboratory, and few, if any, tests are too large or complicated to be handled. Evidence in this latter regard is seen in the 1,000,000-lb. tension and compression testing machine employed in the physical laboratory, and in the complete locomotive testing plant which permits full load running tests of the largest locomotives on the road.

Much of the research and test work is in connection with the materials, equipment and devices used by the mechanical and operating departments and is designed to insure the highest efficiency and safety in the work and output of these departments, but to an increasing extent and degree of precision, attention is being given also to the study, analysis and testing of methods, materials and machines used in the construction and maintenance of the roadway and track.

Evidence of this is seen in the fact that all research, development and test work of primary interest to the engineering and maintenance of way departments is now concentrated under the direction of a specially qualified engineering officer, located at Altoona, who is, at the present time, carrying forward some 225 separate investigations.

M. of W. Department Testing Greatly Improved

Prior to 1928, all laboratory testing for the maintenance of way department was done by the mechanical department laboratory at Altoona, while the field testing was carried out largely under the direction of the different division engineers and was spread quite generally over the road. Many worth-while results were achieved through the tests made under these arrangements, but consideration of the work being accomplished made it obvious that still more valuable and authentic results could be gained by concentrating all of the maintenance of way research and testing work under the direction of an experienced engineering officer.

Accordingly, in the latter part of 1928, the assistant engineer of standards was charged with the initiation and carrying through to completion of all research and test work of primary interest to the maintenance of way department. Headquarters for this work were established in the mechanical department laboratory at Altoona, which not only made possible the closest co-operation with the engineer of tests and the chief chemist of the road and their respective departments, but which also located the center of maintenance of way testing within a limited area of ideal track and traffic conditions for making practically all classes of field tests.

Within the last four years, the assistant engineer of standards, working under the direction of the chief engineer, has undertaken several hundred research and test projects covering a wide range of materials, equipment and tools. These projects have dealt with the design, manufacture and treatment of rails; rail wear and deflection; rail joint construction; rail batter; and many other similar or allied subjects, including the testing in the laboratory and field of a wide range of such devices as rail anchors, bolts, nuts, nut-locking devices, spikes, tie plates, switch points, wheel stops, bumping posts, paints and anti-corrosive materials.

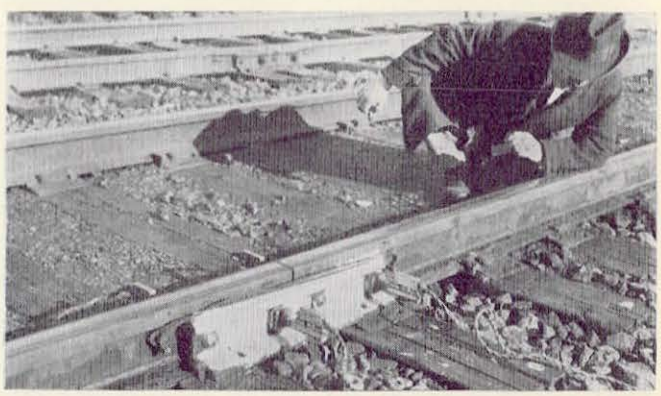
Among the track and roadway materials and appliances under test are several types of highway crossing paving materials and a number of types of lights and signs for different purposes; more than a dozen types of rail and flange lubricators, as well as oils and greases intended for curve oiling; and a number of types of snow melters and switch heaters. In addition, more than 40 tests of track tools are under way, and many service tests are being made of roadway machines.

While many of the projects undertaken are largely in the nature of laboratory and field tests, research enters to some extent into practically all of the investigations being made. As a matter of fact, in many cases, the investigations undertaken are entirely problems of research. Among the latter are the study being made of stresses in rails, joint bars and track bolts; the investigation of the causes of transverse fissures and other hidden defects in rails; study and analysis of the factors which enter into rail batter; the development of a scientific method of heat treating rail ends; and study of tie plate fastenings with the aim of preventing mechanical destruction of ties.

Certain of the studies and examinations called for, especially those confined to the laboratory, can be carried out in a relatively short time. On the other hand, most of the field tests or investigations are designed to allow the facts to be disclosed under actual service conditions, and, therefore, require extended periods of time.

Pennsylvania Has Thoroughly Equipped Laboratories

In the laboratories at Altoona, the maintenance of way department has at its service some of the largest and finest physical, chemical and electrical research and testing facilities in the country. These laboratories, which are operated under the general direction of the chief of motive power and under the direct supervision of the engineer of tests and the chief chemist, are all housed in one three-story brick building. In the layout of the facilities, the first floor is occupied by the physical laboratory; the second floor by the electrical laboratory and part of the chemical laboratory; and the third floor is used exclusively as a chemical laboratory. The basement is utilized essentially as a machine shop in connection with the work of the physical laboratory, while a pent house on top of the building is completely equipped as a photographic laboratory.



Measuring the Stresses in Track Bolts

Within these various laboratories, practically every form of physical, metallurgical, chemical and electrical analysis or test of interest to the railway can be made. Some of the special machines and units of equipment provided in the laboratories include six tension and compression machines with capacities ranging from 300,000 lb. to 1,000,000 lb., an abrasion testing machine, a vibratory machine, machines for applying quick-bend and

The Contour Machine Answers the Questions of Rail Wear or Distortion

fatigue tests, a special rail anchor testing machine, cement testing facilities, Brinnell and Rockwell hardness testing machines, power saws for cutting test specimens, and power grinders, polishing machines and etching facilities for preparing these specimens for study through the use of photomicrographs. These facilities, and others of a more or less similar nature, are in addition to those in the electrical laboratory where all testing of electrical materials and equipment is done, and in the chemical laboratory, where analyses are made of all such substances as water, paints, lubricants, rubber, and waterproofing materials.

Among the major items of testing done by the physical laboratory for the maintenance of way department are the examination of rail defects and failures; the drop testing of rails, which is done with a special drop testing machine equipped with a series of weights ranging from 1,000 to 27,000 lb.; the study of the strength and efficiency of rail joints under static load; and the determination of the strength of welds and welded joints in both track and bridge construction.

Field Tests Employed When Practical

Whenever practical, field tests are established under actual service conditions, greater faith being placed in these tests than in any corresponding laboratory tests. This practice has been adopted since it has been found in some cases that the results of laboratory and field tests are not in full agreement, and because of the feeling that the results of field tests best indicate the general serviceability of the materials or products under consideration. Of course, many laboratory tests are invaluable and frequently are the only kind that are practical.

Most of the field testing and test installations are made in the tracks between Lewistown, Pa., about 70 miles east, and Johnstown, Pa., about 37 miles west of Altoona. This territory, all of which is within easy reach of the testing force, provides heavy traffic conditions, and, including the crossing of the Alleghany mountains, affords practically every condition of grade and alinement on the road. The relatively few tests which must be made outside the limits of this territory are located at other points where some particular situation or condition is imposed. The more important of these scattered tests have to do with railway crossings, which are usually set up within terminals or at other points where severe service conditions prevail.

Some of the most extensive and interesting field tests being made have to do with rail and rail joints. In these, which have required the construction of a considerable number of specially designed precision measuring instruments, many thousands of measurements have been recorded yearly to make possible the accurate determination of results. Some of the specific rail tests cover treated and untreated rails of the Pennsylvania's new 131-lb. section. Others cover untreated rails of the road's new 152-lb. and standard 130-lb. sections. In all of these tests, where comparative results are sought, the greatest care is exercised to see that balanced conditions with regard to traffic, alinement and grade are not only insured initially, but that they are not disturbed during the life of the tests.

Rail Abrasion, Deflection and Batter Studied

In connection with the rail tests, which usually embrace certain features of the joint construction, the measurements taken include abrasion, joint deflection, rail batter, joint opening, and wear in the rail fishing surfaces. All of these measurements are recorded immediately after an installation is made and then subsequently at such intervals as may be considered necessary or advisable to disclose the facts being established.

Rail abrasion is measured with a contour machine which, when clamped over the rail, records on a card in pencil the exact contour of the head, as traced by the feeler points of the machine in the hands of the operator. In measuring rail end batter, readings are taken with a 10-in. steel straight-edge provided with a sliding rider on its top edge, which carries an Ames dial gage. This instrument indicates the amount of batter within 0.001 in.

Joint deflection is measured with a 48-in. graduated straight-edge set on top of the rail, in conjunction with taper gages, which permit the determination of the amount of deflection in thousandths of an inch at any points desired. The space between rail ends, if any, is measured by a taper gage reading to $\frac{1}{32}$ in., and the temperature of the rails is noted at the time of measurement.

Many Studies Made of Rail Joints

Many field measurements are made in connection with the numerous rail joint tests, these including, in addition to rail deflection, rail batter and rail end over-flow measurements as mentioned above in connection with the rail tests, the measurement of vertical deflection under static engine loads, which is effected with special graduated scales and a surveyor's level; the measurement of the amount of take-up in joints as wear occurs on the bars and fishing surfaces of the rail, which is effected with a specially designed U-shaped instrument with a

micrometer gage reading to hundredths of an inch; and the measurement of the wear in fishing surfaces, which is made with feeler gages. Other measurements made in connection with the field tests of rail joints include the measurement of the lateral deformation of joint bars, made with special gages in connection with an Ames dial gage, and the measurement of the vertical and lateral camber in free bars, made with another style of straightedge and taper gages. In all of these tests, careful records are kept of the tonnage moving over the tracks and of all man-hours of labor expended in joint maintenance.

Some of the most scientific tests which have been made on rails and rail joints on the Pennsylvania were conducted in 1930 with magnetic strain gages and oscillographs. These tests were designed to determine the horizontal and vertical forces exerted by locomotives and cars of different weights and classes operating at different speeds up to 104 m.p.h., and also the resultant stresses set up in the rails, joint bars and joint bolts. These tests, which extended over a period of about six weeks, produced many interesting results, not only in connection with a study of the different parts of the track structure, but also in checking features of locomotive design.

Rail Defects and Treatment of Rail Ends Studied

Many other pressing maintenance problems have also been given considerable attention, including rail defects, particularly the transverse fissure; rail end batter; and the mechanical destruction of crossties under the tie plates. Ever since 1929, with the development of the transverse fissure detector car, the Pennsylvania has had one or more of these cars in operation, weeding out suspicious rails and accumulating data of value in studying the causes and growth of transverse fissures. Furthermore, hundreds of actual defects have been studied with the photomicrograph and the closest attention has been given to the mill practices under which its rails are rolled.

In connection with the effort which is being made to minimize rail end batter through the heat treatment of the rail ends, the Pennsylvania has lent its aid, giving more specific attention to increasing the practicability of this practice, to the end that more uniform results might be secured. Thus far, tests on the Pennsylvania have indicated that the increased hardness and toughness in rail heads, which are being sought through heat treatment, are being brought about, and, therefore, that rail end life should be increased materially.

In the study of the elimination of mechanical wear of crossties under the tie plates, the maintenance of way test department has given weight to the theory that such mechanical wear can be minimized by fastening the tie plates rigidly to the ties. To determine the correctness of this theory it has installed comparable test sections of three different methods of fastening the plates to the ties. The methods employed include the use of two cut spikes as anchor spikes, four screw anchor spikes, and four ¾-in. bolts extending completely through the tie. In all cases, cut spikes were used to hold the rail. While it will undoubtedly take a number of years to determine the true relative value of the different methods of fastening, it is interesting to note that already, after little more than a year in service, indications point toward the value of fastening the plates securely, and, furthermore, to the fact that there will be less wear of the ties under the plates where bolt and screw spike anchors are used than where the fastening is made with cut spikes.

The investigation and test work also extend to practically all roadway machines and tools purchased to insure their quality and effectiveness, and their ability to stand up under the work for which they are designed. In addition, the Pennsylvania also carries out many studies and investigations of the methods, materials and equipment employed on other roads, and of the facilities and manufacturing methods of companies supplying it with its requirements for materials, tools and equipment. Thus, many investigations are made at steel mills and manufacturing plants with the hope of bringing about the closest co-operation, and, as a result, direct benefit through better adapted and high quality products.

Results Prove of Large Benefit

One of the outstanding features of the investigating and test work being conducted by the maintenance of way test department is the care with which this work is carried out, and the precision and detail with which all observations and measurements are made. This is recognized as a prerequisite to research and test work of value, and to this end the Pennsylvania has directed its effort; first, through centralizing responsibility in specially qualified hands, and second, through the provision of adequate and appropriate testing equipment and measuring instruments, even to the extent of constructing many specially designed units unavailable in the market.

The Pennsylvania, and, in fact, the railway industry as a whole, has already derived large benefits from the tests, investigations and studies made on this one road, but these are only a part of the larger benefits which will accrue as the work is carried forward. This road's studies of rail and rail steel composition, and the new rail sections which it adopted as the result of these studies, insure increased safety and comfort in travel and promise large savings in expenditures for rail renewals, and its study of the heat-treatment of rail ends promises further to improve riding conditions, to reduce maintenance expenses and to increase further the service life of rail. The transverse fissure problem has not yet been solved, but the work of the Pennsylvania in this regard has added largely to the safety of its tracks and has contributed materially toward the ultimate solution of the problem.

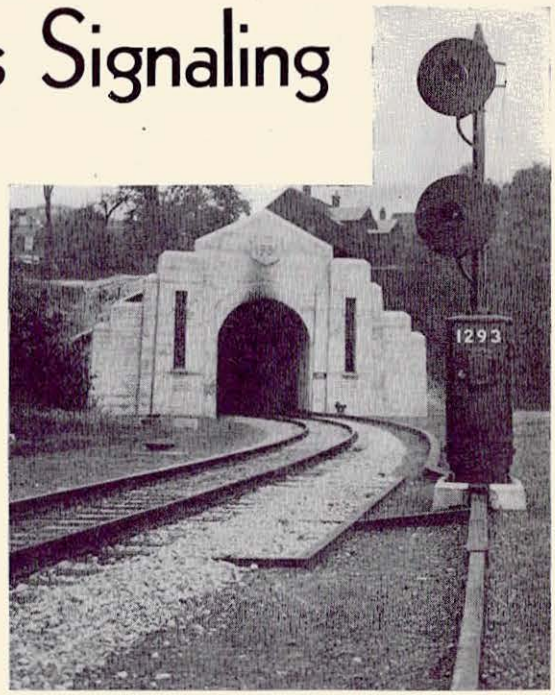
Many refinements in the track structure, with greater efficiency of the individual units involved and the structure as a whole will result from the many tests under way, with both increased safety and economy of maintenance. Aside from these large advantages to itself, the test and research work on the Pennsylvania is having a far-reaching effect upon the railroad supply industry and upon the practices of other roads, all in the interest of safer and more economical rail transportation.

T. J. Skillman is chief engineer of the Pennsylvania, while F. M. Graham, assistant engineer of standards, and his assistant, E. E. Martin, assistant engineer, are in direct charge of the maintenance of way department test work. All laboratory testing for the maintenance of way department is done under the direction of F. M. Waring, engineer of tests, and M. E. McDonnell, chief chemist (mechanical department officers) acting under F. W. Hankins, chief of motive power.

THE NEW RAILWAY STATION in Johannesburg (South Africa) has been practically completed and was expected to be informally opened to the public on November 15, according to the Department of Commerce. This major project, which has included the reconstruction of old buildings, as well as the creation of several large new units, new services, and the adoption of modern signaling and other equipment, was sanctioned by the Union's Parliament some four years ago. The total cost of the scheme was approximately £740,000.

Canadian Pacific Installs Signaling for Tunnel

Train movements controlled by signals—Fan for ventilation controlled by track circuits—Special indication system protects track forces

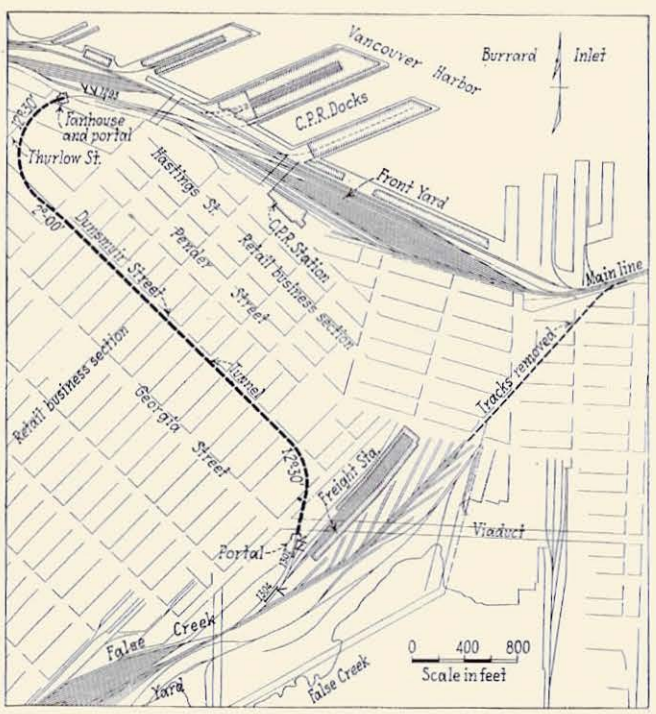


Signal 1293 Near West Portal Which Includes Fan House

THE AUTOMATIC signaling is one of the interesting features in connection with the new 4,600-ft. single-track tunnel under the business section of Vancouver, B. C.* This tunnel was constructed by the Canadian Pacific to replace a portion of a line known as the English Bay Branch, which connected the Front Yard on the main line along Burrard Inlet, with the False Creek yard, with its enginehouse, repair shop and freight sheds, as well as a large industrial and track warehouse area. The principal purpose in building the tunnel was to remove the tracks from the business streets of the city.

The traffic through the tunnel consists principally of light engines, switching cuts and freight trains, about 52 movements being made daily. Train movements through the tunnel are directed by signal indications. In normal operation, the signals are controlled entirely automatically by track circuits. However, to enable the yardmaster to give preference to certain trains, a set of two single-pole single-throw knife switches are mounted in the office at the Front Yard and the circuits are arranged so that the yardmaster, by operating these switches, can clear one signal or the other, as he sees fit.

* The details of the construction of this tunnel were set forth in an article by F. W. Alexander, Engineer Maintenance of Way, Western Lines, Canadian Pacific, on page 728 of the *Railway Age* for November 26, 1932.

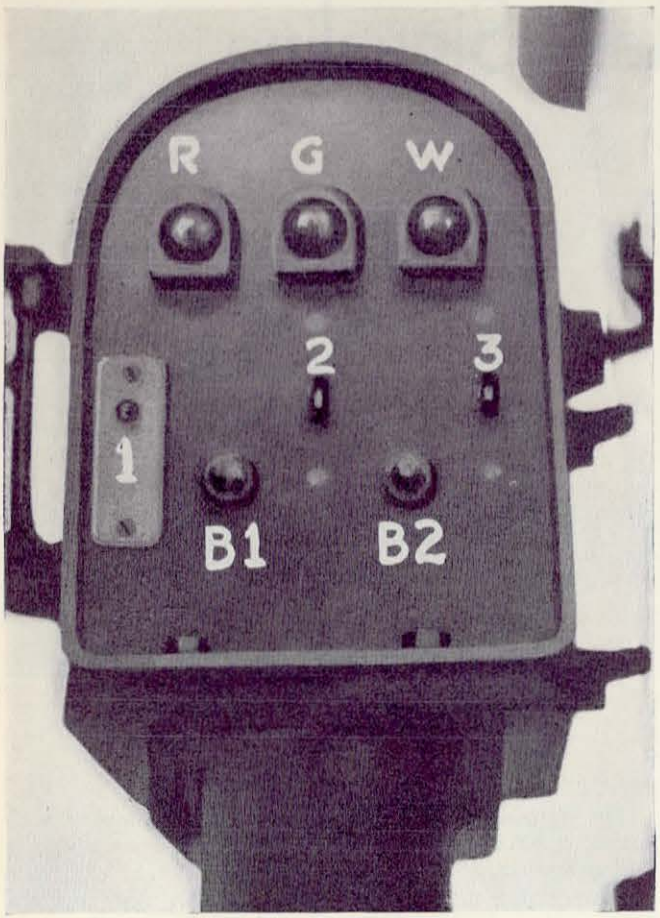


Plan Showing Location of Signals

The signals are General Railway Signal Company 110-volt a. c. SA-searchlight type. Of the two signals governing movements into the tunnel, one at either end, each has two units, the top displaying red or green; and the lower red or lunar white. A red-over-red aspect indicates that there is a train in the tunnel block, while red-over-lunar-white indicates that the track forces or other employees have the block set for their protection. Green-over-red indicates proceed, block is clear. The top units of the two tunnel signals are checked against each other so that a signal cannot indicate Proceed unless the opposing signal is at Stop. Owing to the curvature, the view of signal 1302 is short. Because of this condition, and also for the purpose of holding trains in the clear at the False Creek yard, a repeater signal *1304* was installed to repeat the indication of signal *1302*. The signal lights burn constantly, one 11.3-volt 14.4-watt lamp being used in each unit. Three end-fed track circuits are used with this installation.

Protection for Employees in Tunnel

As a means of protecting track forces and other employees working in the tunnel, a system of indicators and signal-control buttons are installed. Each indicator unit includes three lamps—red, green and lunar white—in a horizontal row, beneath which are three switches and, at the bottom, two push-buttons. All of this control and indication equipment is housed in a small iron case with a hinged door at the front; the door is equipped with a spring to hold it closed, and is fastened with a special lock, keys for which are issued only to authorized persons. One of these indicators is mounted on each of the two tunnel signals and in each of the four safety bays in the tunnel. When circumstances require, the man in charge goes to one of these units and unlocks the door. When he opens the door, the small switch (No. 1 at the left in the illustration) causes the lamp in the red indicator unit to be lighted if a train is in or approaching the tunnel. This constitutes a warning for the man at the indicator not to operate any push-button to stop the train, unless, of course, there was some emergent condition



An Indicator Is Located in Each Safety Bay

requiring him to make every effort to stop the train at once.

If the red lamp in the indicator does not light when the door is opened, the employee knows that there is no train involved and he operates the small switch (*2*) under the green unit. If the green lamp is then lighted, this authorizes him to push the left button *(B1)* in the lower row, which causes each of the two tunnel signals to set up an aspect of red-over-lunar-white. As a final check, the man operates another small switch *(3)* under the lunar white unit of the indicator which causes this light unit to repeat the indication of the tunnel signals, thus assuring the man that the block is protected. The man then shuts and locks the case. When the work in the tunnel is finished and all is ready to clear the block, the man in charge returns to one of the indicator units, and pushes the button *(B2)* at the lower right, which causes the signals to be restored to normal, after which the green lamp in the indicator is lighted.

Control of Ventilator Fans

The smoke is cleared from the tunnel by means of large exhaust fans mounted in the combined fan-house and portal structure at the Front Yard end of the tunnel. The ventilating equipment consists of two double-width double-inlet silent-vane fans equipped with S-K-F roller bearings. Each fan is operated by an 80-hp. 360-r.p.m. horizontal revolving-field synchronous motor with directly connected exciter. The motors run continuously as a means of correcting the power-factor of the line, and, furthermore, this provides quicker starting of the fans. The fans are controlled automatically by the track circuits. The magnetic clutch between the motor and the fan is controlled by a 198-v. a. 110-volt d. c. circuit, fed from the exciter and cut through a 6-volt Union DT-10 time-element relay, so arranged that the fan will cut in and be at full speed in 20 sec. A similar arrangement for the second fan is timed to cut in 20 sec. after the first one. It has been found that the fans will clear the tunnel of smoke in about four minutes. Therefore, four minutes after a train clears the track circuit the fans are cut out. The time-element relays operate on d. c., the remainder of the track circuit, signal control and signal operating circuits being a. c. The d. c. supply is provided by an Edison primary battery of 10 cells.

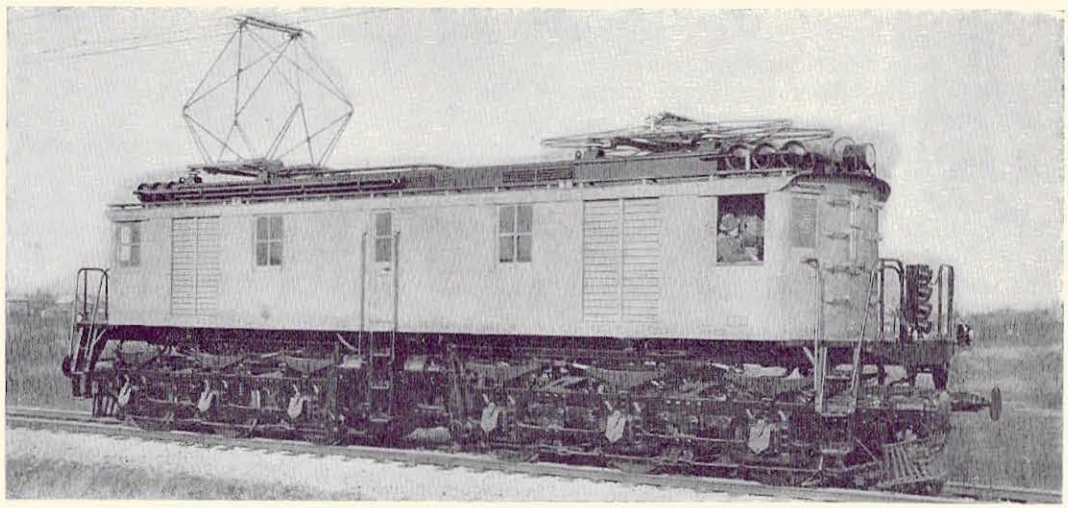
Power at 2,200 volts 3-phase, 60-cycle is brought in through an underground cable to the fan house, where it is transformed to 550 volts for the fan motors and to 220-110 volts for the lighting and signal circuits. A three-wire 220-110 volt circuit extends through the tunnel, with a light in each of the four safety bays, and, at intervals of 100 ft., with fused receptacles where portable lamps with extension cords can be plugged in, to afford light for maintenance work.

The wires for the lighting circuit, as well as for the signal control circuits, are carried through the tunnel in trunking built up of treated wood and hung on bolts set in the concrete wall of the tunnel so as to bring the trunking about 2 ft. above the base of the rail. This trunking has two grooves, one for lighting wires and the other for signal wires, the latter being in a 13-conductor No. 14 lead-covered cable made to meet A.R.A. Signal Section specifications. Telephone communication is provided by a system comprising a phone in each safety bay, at each tunnel signal, in the yard office at False Creek and in the office at Front Yard.

The signal equipment for this installation was furnished by the General Railway Signal Company, and was installed by signal forces of the Canadian Pacific, according to plans developed by C. R. Hodgdon, signal engineer, the construction being under the jurisdiction of F. W. Alexander, engineer maintenance of way to whom we are indebted for the information presented here.

* * *

The Melrose Central Building, Which Includes the New York Central's Dining Car Commissary at Mott Haven, N. Y.



One of the Electric Locomotives Built by the General Electric Company for the Suram Peak Electrification U. S. S. R.

Electric Locomotives for Russia

Soviet factory in Moscow will supply traction motors for six of eight units on first U. S. S. R. electrification

By B. S. Cain

Transportation Engineering Department, General Electric Company

THE last two of the eight electric locomotives built at the Erie, Pa., works of the General Electric Company for service on the Transcaucasian Railway of the U. S. S. R. have been shipped from the factory. They will be used on a 39-mile section having heavy grades. The locomotives are for both freight and passenger service, are of the six-axle type, and weigh 145 tons each. They can be coupled together to produce units of 290 tons and 5400 horsepower, among the most powerful in Europe. Regenerative braking is one of the features of their design.

The initial electrification covers the Suram Peak section of the Transcaucasian Railway which connects Baku on the Caspian Sea with the ports of Batum and Poti on the Black Sea. The section is 39.2 miles long and includes a 2.5-mile tunnel on a 1.8 per cent grade. The maximum grade is approximately 3 per cent and over half the line is on curves. This is the most severe section, but it may be decided to extend the electrification ultimately to Tiflis, about 74 miles further. The greatest elevation to which the railroad rises is about 2,550 feet. The initial electrification is principally on the western slope, while the extension to Tiflis is on the eastern slope, with comparatively easy gradients.

The traffic will consist principally of oil tank trains of 1,650-1,800 tons (tons of 2000 lb. and not including the locomotives). There are also passenger trains of about 600 tons and general freight trains of about 1,100 tons. The oil traffic moves in the westerly direction, which is principally down grade, with a maximum of 2.74 per cent (compensated). The heavy trains will be handled with two locomotives on the more severe grades.

The conditions are favorable for electrification; in particular regenerative electric braking will allow the heavy trains to be controlled on the down grades and will appreciably reduce the net energy consumption for traction. Electrification will also allow the capacity of the single line to be increased. The specifications call for 34 trains a day at the beginning and 46 after five years, with a theoretical capacity of at least 60 trains a day.

This project was studied by the engineers of the Soviet Union, who ascertained the experiences of other electric railroads in various parts of the world, a Commission visiting the United States in 1929. As a result of these studies it was decided to use the 3000-volt direct current system which has proved its suitability for heavy mountain service, particularly on the C. M. St. P. & P., the Mexican Railway, and the Paulista Railway of Brazil. Power is obtained from hydro-electric stations and is converted to 3000 volts d.c. in three substations, equipped with motor-generator sets.

The type of locomotive selected by the Soviet engineers has the entire weight of 145 tons carried on six driving axles, which are arranged in two articulated trucks. This is the simplest and most compact design permitted by the limitation of axle loading to 48,500 pounds. The articulated design allows easy operation on the sharpest curves, which are a little less than 12 degrees. The maximum speed is 40.9 m.p.h.

The mechanical design of the locomotives was first made in even metric dimensions, incorporating standard U. S. S. R. materials. These drawings will be used for locomotives which are to be built in the Soviet Union. The locomotives built in the United States were then designed to use American standard materials, but in such a way that all principal parts, such as trucks, wheels, axles, springs, brake rigging, etc., and all electrical equipment are interchangeable between the two designs. Similarly all mechanical parts subject to wear or requiring replacement are designed to be renewed with U. S. S. R. standard material manufactured to metric drawings. A similar provision is made in the case of the traction motors the shafts, bearings, frame fits, brushes,

etc., being metric standards and the gears being cut to metric pitch.

The first two American built locomotives are complete, but the remainder are being furnished without traction motors. A Soviet factory in Moscow is building these motors from the American designs. The general mechanical design is conventional, with cast steel trucks and a structural steel cab mounted on center plates. Provision has been made for adding about 10 tons of ballast at a later date.

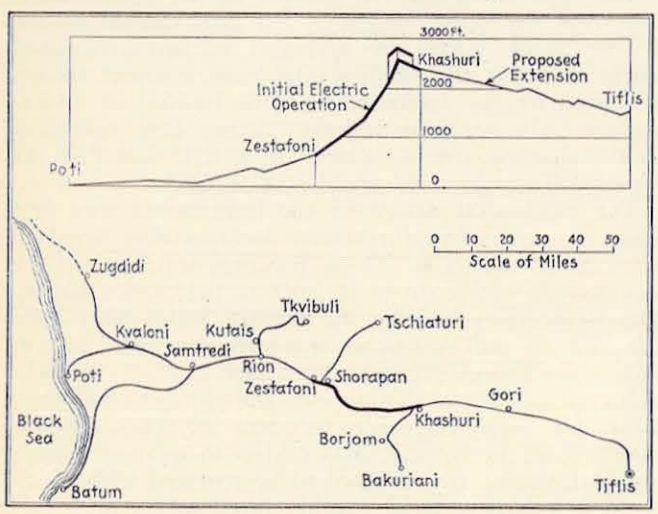
The couplers were required to conform to the U. S. S. R. standard drawings of hooks and links, and to have a nominal capacity of 22 tons. The hook is a high tensile strength steel casting and the links, turnbuckles, etc., are chrome-nickel steel forgings. Samples were tested to destruction and showed a strength of 94 tons for the hook and 65 tons for the assembled links and turnbuckle. All these parts were given proof tests of 33 tons. Provision has been made for the future change to an automatic coupler, and for this reason a National friction draft gear has been provided.

Principal Dimensions and Characteristics

Length over buffers	54 ft. 0 in.
Total wheelbase	40 ft. 0 in.
Rigid wheelbase	13 ft. 9 in.
Track gage	5 ft. 0 in.
Diam. of wheels	47¼ in.
Total weight (incl. ballast)	291,000 lb.
Weight per axle	48,500 lb.
Tractive Force and Speed	
1-hr. rating, full field	53,500 lb. at 19.1 m.p.h.
1-hr. rating, weakest field	40,500 lb. at 25.3 m.p.h.
Cont. rating, full field	45,300 lb. at 20.0 m.p.h.
Cont. rating, weakest field	34,200 lb. at 26.6 m.p.h.
Maximum Speed	40.4 m.p.h.

The air brakes are supplied with air by two General Electric motor-driven air compressors with a total rated piston displacement of 150 cubic feet per minute at 130 pounds per square inch air pressure. Two hand brakes are furnished, one for each truck.

The six traction motors have a total full field rating of 2725 hp. at 19.1 m.p.h. for one hour or 2405 hp. at 20 m.p.h. continuously. They are axle-hung, with spring nose supports and drive through twin cushion gears with a ratio of 89/20. The electrical control is arranged for three motor combinations and three field strengths in each combination. Regenerative braking is provided with 15 speeds in each of the three motor combinations. The locomotives may be coupled in multiple and operated from a controller at either end of any cab.



Profile and Map Showing Location of Electrified Section on Transcaucasian Railway

There is a 3000-volt dynamotor-generator set which provides 1500-volt power for other auxiliaries and 50-volt power for control and lights. A 1500-volt motor-generator set is used to excite the traction motor fields during regeneration. Two 1500/3000-volt motor blowers ventilate the traction motors. Current is collected with two, double-shoe, air raised pantograph collectors.

The main circuits are protected by a high-speed circuit breaker, individual overload relays in the motor circuits and an overvoltage relay. The auxiliary and control circuits are protected by fuses. There is an aluminum cell lightning arrester. The current collectors are interlocked with the two doors of the high tension compartment so that the collectors cannot be raised unless both doors are shut and so that both doors are locked as soon as the collectors are raised.

The operating cabs are lined with granulated cork and at each position there are four 1500/3000-volt sheath wire heaters with a rating of 1.7 kw. each.

The General Electric Company has cooperated with representatives of the Soviet railways and manufacturing industries during the design, manufacture, and test of these locomotives, which will be the first in the U. S. S. R. Tests of the traction motors have shown that they meet the requirements, including a starting tractive force for the locomotive of 79,400 pounds available for 8 minutes.

Cab Signals in Europe

QUESTION IX, to be discussed before the National Railway Congress at Cairo, Egypt, next year is entitled "Automatic Train Control and Train Stop" and a report on the subject, by V. Vlaikoff, signal engineer of the Bulgarian State Railways, is published in the October number of the International Railway Congress bulletin. This report covers inquiries made in France and 11 other European countries, but does not include Britain, Germany or America.

The report gives no information about experience with automatic train control, for there is no installation of any such system in regular use on any road in the countries reported on; it is devoted to cab signals, and the principal systems in use are described at considerable length, with drawings. Automatic train control is discussed briefly and the author quotes the reasons given by various administrations for not using such devices.

The first system to be mentioned is the well-known Crocodile system of the Northern of France which was first installed in 1872; though it is said that the apparatus in its final form has been in use only since 1927. From 1878 to 1896 the Northern had a system which acted on the brakes, but in 1898 the brake-setting apparatus was removed because it worked very irregularly. The number of locomotives fitted with cab signals at the present time is 2,371, and 95 more are being fitted; the number of crocodiles is 4,972. The Flaman speed recorder is used on all the locomotives, in connection with the cab signals. The Flaman apparatus costs 6,650 francs per locomotive, and further improvements in it are constantly under consideration.

The Northern of Belgium employs this same system of cab signals but to what extent is not stated. The French Midi uses the Hausshaelter system which is said to be like that of the Northern of France.

The Paris & Orleans uses an apparatus, repeating and recording on the locomotive the position of the home signal, on 1738 locomotives and these are used on 2,346

miles of line; and also the Rodolausse train control system on ten locomotives, in use on a line 27 miles long. This latter apparatus is only used experimentally and has had to be altered several times.

On the French State Railways the Augereau cab signal system has been in use since 1923 and is said to be "fitted on all locomotives." It includes a speed recorder which imprints on paper tape a mark when a distant signal is passed at danger.

The Paris, Lyons & Mediterranean has 4,673 locomotives equipped with apparatus to repeat and record on the locomotive "certain signals which have been run past at danger." The length of line thus equipped is 4,213 miles. Two types of apparatus are in use, the P-L-M. type and the modified Eastern railway type; the two being alike except in details.

The Belgian National uses two cab signaling systems, the Flaman and the Hasler. The Flaman is on 62 locomotives running between Brussels and Mons, 38 miles, and the Hasler on 250 locomotives, running on the Brussels-Arlon line, 123 miles. These installations have been in use since 1930. This road has ordered ten sets of automatic train control apparatus.

The Italian State Railway is about to undertake tests of an audible and visual cab signal designed by an engineer of the system, and 30 locomotives are being fitted. In this system the impulse is transmitted from the track to the locomotive by magnetic induction, the only induction apparatus mentioned in the report.

On the Swiss Federal Railways, one locomotive has been equipped with track and locomotive magnets of the Signum Company for trial on a line 19 miles long.

Adjusted Carloading Figures Show Improvement

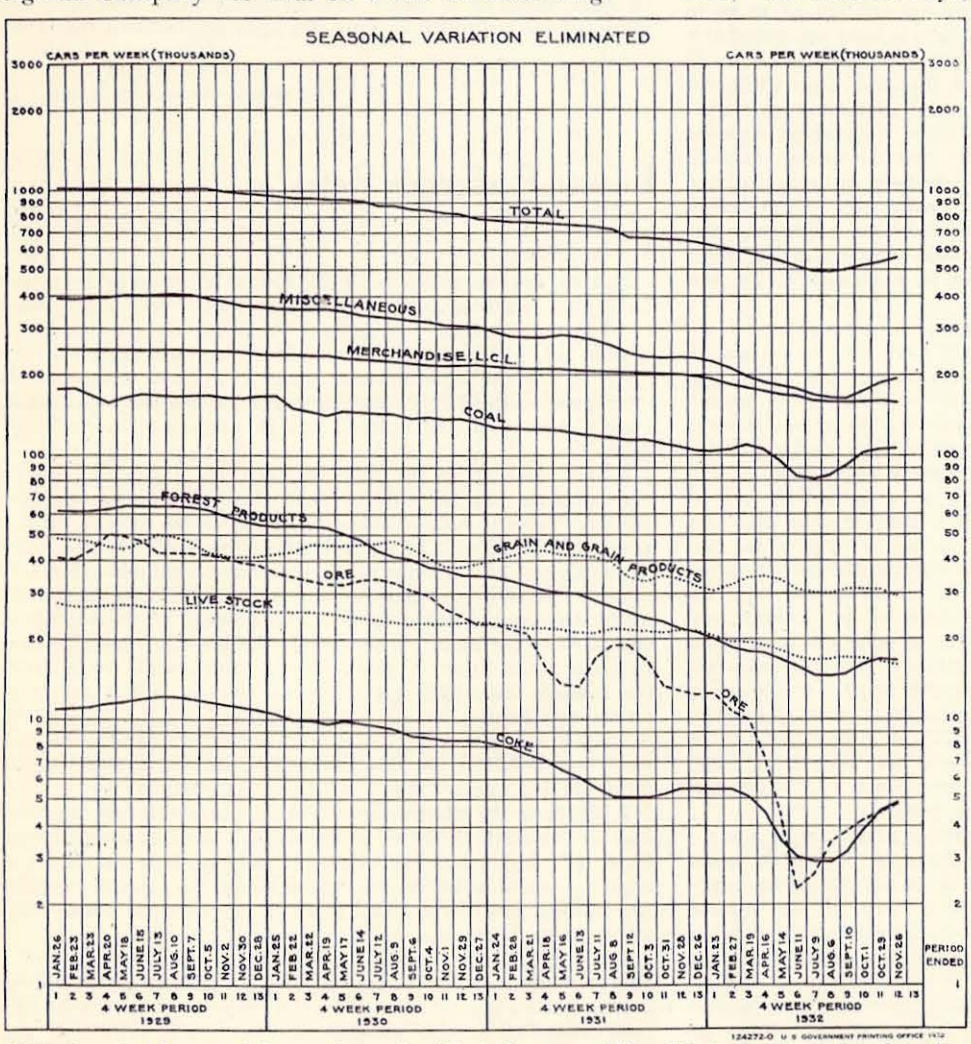
WASHINGTON, D. C.

THE gradual but consistent relative improvement in railway traffic in recent weeks as measured by weekly car loading figures is strikingly illustrated by a chart prepared by the Bureau of Statistics of the Interstate Commerce Commission in which adjustments have been made to eliminate seasonal variations and the disturbing effects of holidays. The seasonal variations have been eliminated by the use of moving averages, producing a curve which shows a constant and steady decline in car loadings from the middle of 1929 to the middle of 1932, followed by a distinct upturn since August which is shown not only as to the total loadings but also as to each commodity classification with the exception of merchandise, l. c. l.

As indicated on the chart the decline was from an average of over a million cars a week throughout a large part of 1929 to less than half a million by mid-year of 1932, since which time there has been an increase to something over 550,000 cars a week.

The basic data are the weekly carloading statistics published by the American Railway Association. These have been arranged, according to a footnote to the chart, in four-week groups rather than in months to avoid the necessity of splitting weeks. "This arrangement, however," the footnote says, "has the disadvantage that the first four-week period ending on Saturday in 1932, for example, was seasonally one day earlier than in the preceding year, and after the second period the difference is two days on account of February 29. This difficulty could be largely avoided either by reforming the Gregorian calendar or by having the American Railway Association make its reporting week end on a different week day each year with one eight-day period at end of year."

The figures are adjusted to make each holiday fall in the same numbered period each year, thus avoiding the sharp dips which are so prominent on the ordinary carloading charts. The seasonal percentages used are based on the five years 1926-1930 and resulting adjusted figures are plotted as a three-period moving average except for the last period on the chart. The use of the 13 periods in this chart should not be construed as an advocacy of the 13-month as against the 12-month plan of reforming the calendar on the "year-day" principle, the footnote says. In both plans corresponding weeks in different years would end on the same day of the month.



Carloadings by Groups of Commodities—Per Week Averages of Four-Week Periods Ending Saturdays

Communications and Books...

The Cost of Not Using the Railroads

SIOUX CITY, IOWA.

TO THE EDITOR:

Morningside College in Sioux City, Iowa, recently had an experience which illustrates the cost of not using the railroads. Our school was scheduled to play a football game with South Dakota State University, a neighboring college, on the South Dakota field at Vermillion, 40 miles from Morningside College. The administration of the college urged the Chicago, Milwaukee, St. Paul & Pacific to arrange a special train at as low a rate as possible. The rate was finally fixed at 77 cents for the round trip, with a minimum of 100 tickets. The schedule was arranged so that everybody would be able to leave after lunch and return before dinner. Even this schedule was altered so that special arrangements could be made without extra cost for those who wished to remain in Vermillion until later in the day, the tickets being honored on later trains arriving in Sioux City near midnight. For two weeks the train was advertised.

In spite of every effort, it was found impossible to secure even the bare 100 for the trip. A special personal canvass was made by the staff of the college, since the president felt that the institution was indebted to the railroad for the extraordinary courtesy it had shown. Out of 800 students and an equal number of alumni, besides numerous friends of the institution, the canvass showed only 22 who were willing to go by special train.

The arguments used against the special train were the familiar ones. It would be necessary to "have someone drive us to the station and meet us when we come home," although there was excellent street car service to all parts of the city. "It costs more to go by train, for we can 'gang up' and five of us go in an auto, and the cost of the gas will be less than one round-trip fare," was another excuse which appeared valid enough to its makers because they failed to consider the other costs which are more or less invisible but which the owner of the car must bear.

Approximately 500 persons from Sioux City alone attended the game. It is not necessary to state that the special train did not run. Everybody drove. One of the most prominent of the college men, when approached personally by the president, thought the special train a "great thing," and elaborately discussed the good time the students would have on it, but when asked how many tickets he would take, he explained that he was going in his car.

The cost of the minor accidents cannot be determined for reports were not made on bumpers smashed and tires repaired. One of the automobiles, however, did turn over. The young man driving escaped with little injury, but the three young women with him were all injured. The estimated cost of the damage to his automobile was $275, and the garage man frankly told the young man that it would not pay to have it repaired at all.

The three young women fortunately were not killed. All of them were cut and bruised. One had a badly injured leg. One was cut about the face so badly that she will be scarred for life. Waiving the personal character of the injuries, the cost of caring for each patient exceeded the total cost of the special train for the round trip. Furthermore, as a result of the accident, one young woman will be out of school for at least one year. This involves a loss to her and to the college. Waiving again the personal items such as the loss of one year of life to the young woman, and the loss of her influence on the campus, the actual financial loss to the college will be $201 in tuition and $295 in dormitory fees. The former item would have been clear profit, for the cost of adding one student is immaterial. Approximately $100 of the latter represents possible profit.

Summing up the cost of not taking the special train, it cost the owner of the car approximately four times the cost of the entire train for the round trip, it cost three times the cost of the entire train in hospital, physicians' and nurses' bills for the injured girls; and it cost in actual cash losses to the college, through one girl being obliged to leave school, more than four times the minimum cost of the special train for the round trip. Eleven times the cost of the special train was spent and lost because rail service was not used. It would have paid the college, the owner of the car, or any one of the injured to have hired the train. They would have saved money, to say nothing of the personal inconvenience and suffering.

The pity is that this happens with such frequency that it is a usual rather than an unusual story. The only difference between this and hundreds of thousands of cases as bad or worse, is that here we have stopped to figure up the cash loss. It is only because of the incurable optimism of the automobile driver that he uses his car for long and hazardous trips. He barely glances at wrecks and comforts himself and his companions with the hope that "we won't have such rotten luck." It is not a matter of luck. Any study of an actuary's tables would have convinced any sane man that as many people traveling as many miles as this group traveled to the football game would have had just such results in the long run. But it is that saving phrase "in the long run" that consoles each rider with the thought that he may escape. It is not a matter of luck; it is matter of inevitable fact that the cost of the trip in accidents alone was 11 times that of the cost of the special train.

Nor is this all of the story. No report was made of minor accidents and such items as flat tires. This is just a detailed examination of the cost of the one major accident. Furthermore, it does not take into consideration the cost of the time wasted by the various parties who aided the injured. Since these are "donated items," it is presumed that they are worthless, but time costs money. One hesitates to estimate the total cost to Morningside College and to its constituency of not taking the train.

The administration announced that it costs too much *not* to use rail service. The Morningside College football team traveled to its next game in a special car on the Illinois Central. The policy of the institution is more definitely pro-railroad than ever.

ROBERT E. O'BRIAN,
President, Morningside College.

Lower Passenger Rates

SPRINGFIELD, MASS.

TO THE EDITOR:

Having been an employee of the railroads for many years and having my small savings in their securities, I am deeply interested in their welfare. It appears to me the time is ripe for a drastic cut in passenger tariffs to meet the competition of bus lines. When the bus companies make a rate less than one-half the regular railroad fare between New York and Boston, it would appear wise to cut the railroad rate to somewhere near the bus fare.

I have investigated six New England bus routes in order to determine the rate per mile in cents which they obtain for their service. There is considerable irregularity in the figures, varying from the lowest of 1.74 cents in the New York—Boston route to the highest of 2.88 cents per mile in the Springfield—Hartford route. This indicates that the strongest competition comes from moderately long distance routes. The average of the six routes is 2.30 cents per mile. A number of the bus lines make a lower rate for round trips of about ten per cent which would make the average lower than given above. All my figures are based on one-way trips.

Taking a longer route, from Springfield to Chicago, the railroad fare is $29.55, the bus fare $19.90, making a difference of $9.65, the bus rate per mile being about 2.16 cents.

I believe in the substitution of buses where the railroad earnings are so small as not to be profitable. In cases where several trains per day in each direction are running, however, it would appear to me to be better policy to meet the bus rates by reducing the railroad fare rather than to enter the bus field where there are so many buses now competing with each other.

It is my opinion that two cents per mile is none too low a rate to really meet the competition in any effective way. Taking a larger, more general view, the great majority of industries have been compelled to make substantial reductions in prices. It may

be asked why should the railroads be exempt from the same trend, particularly when in many excursions during the present year good profits were made on a much lower rate than two cents per mile.

EVERETT W. LEWIS,
Formerly Assistant Engineer,
Northern Pacific, and
New York, New Haven & Hartford.

More Action Needed

CHICAGO.

TO THE EDITOR:

It is with much profit, pleasure and satisfaction that I read your editorials in the *Railway Age*. They continue to be better and better. You are doing a wonderful work not only for the railways, their employees and their owners, but for the general public as well.

Having been in the railway game all my life, it strikes me that railway officers are not putting up the fight they should, particularly with the Interstate Commerce Commission. I was in Washington last spring and in contact with many of the members of the House at the time that the bill to abolish the recapture clause of the Transportation Act was pending, and feel sure that if the railways, their owners and in particular their employees, had brought sufficient pressure to bear they could have put it over.

You must agree that for many years the railways had everything their own way. Never was a new line built unless they were first assured that it would pay for its cost in a relatively short time. In other words, the public was forced to cater to the railways, who, lacking competition from other means of transportation, had everything their own way. Now that other means of transportation have been highly developed (truck, bus, aeroplane and private automobile), the railways (hog-tied by the out-of-date rulings of the Interstate Commerce Commission) seem to be more or less helpless, which is due in part to the fact that they—never having had to sell their wares—have no *sales force* to sell what they make to the public at large.

For example, go into the average railway passenger ticket office and ask about going from somewhere to somewhere. Then note the almost universal lack of interest displayed by the man behind the counter. He can usually take plenty of time to sell you a ticket, but as for getting the business for his employer he is a complete washout. There prevails a sort of take-it-or-leave-it attitude, and, think of it—the customer's first and only means of contact with the railway. On the other hand, go into any bus ticket selling-office—maybe it's around the corner in some undesirable location—and the man behind the counter (usually in a natty uniform and proud to wear it) is going to get your business or know the reason why. The same holds good with regard to freight business.

Another thing the railways have got to do is to SPEED UP both passenger and freight service. Their local passenger traffic is gone for good as the private automobile (85 per cent) and bus (15 per cent) will continue to handle that business. They are losing a lot of through passenger business because one can, in many instances, make better time in one's automobile, and this holds good for distances of 300 to 500 miles. Granted that the railway is the cheaper means of getting there, when one stops to figure the cost of running the automobile, nevertheless who wants to ride on the average slow through train with all its discomforts when one can go by his automobile with every comfort.

If the railways could only see their way clear to abolish those damnable seniority rules, put the younger engineers and conductors in charge of trains and speed them up so no one by means of private automobile or bus could possibly hope to compete in either speed or time, they would get back a goodly portion of the through passenger traffic they have lost, and the same holds good in many instances with regard to freight now hauled by trucks. The railways have every facility for such higher speed movements, but seem to lack the nerve to put them into effect.

You, along with most of my good friends, had a good laugh when back in 1920 I began advocating aviation as a means of fast passenger travel, but it is here and growing in popularity every minute. People want speed, why, they don't know, but they do. Possibly it is because nearly everyone is accustomed to driving his own automobile over the existing good roads (mostly built by railroad taxes) at from 50 to 75 miles per hour so he simply cannot longer tolerate train speeds averaging around 40 miles per hour.

Look at the ridiculously slow service between Chicago and Florida, Chicago and California, or almost any other distant points. Is it any wonder most of the people go and come in their own automobiles?

Speaking of speed, I understand that already a corporation, which has had much experience in working with light alloys (Duralumin) and in the streamlining of airships, has started the development of an extremely light weight, thoroughly streamlined, air-conditioned, high-speed rail motor car to transport 50 passengers and be able to maintain speeds up to 100 miles per hour. There are many stretches where such a high speed motor car could be used to advantage. For instance, on the Alton between Chicago and St. Louis, 286 miles, all double track, with heavy rails, automatic signals every mile and no heavy grades or sharp curves, the 286 miles ought to be covered easily in 3½ to 4 hours. Now, who would want to spend a night in a sleeper if he could leave either city after a business day, say at five p. m., and be in the other city by nine p. m., or leave either city at eight a. m., be in the other one by noon, and get back home the same day? Chicago-St. Paul, 408 miles; Chicago-Detroit, 283 miles; Chicago-Omaha, 488 miles; Chicago-Cleveland, Chicago-Cincinnati, are all in the same category. Think it over, it's coming. Such a light weight car would be far easier on the track than the existing all-too-heavy trains.

Owing to the long existing railway practice of making passenger (and freight cars as well) plenty strong and seemingly regardless of weight, the existing equipment is ridiculously heavy and unnecessarily pounding their tracks to pieces. Look at the modern Pullman or day coach. The weight compared to the load it carries, even if every berth or seat is filled, is absurd, and think of the cost of maintaining the tracks under it, and so on.

FORMER RAILROADER.

Combined Electrical Maintenance

TO THE EDITOR:

Referring to your editorial on combined electrical service, published on page 727 of the November 26 issue of the *Railway Age*, "Ye Editor" seems to have taken the bait and swallowed hook, line and sinker, of the propaganda that has been disseminated by certain signal engineers and their supporters for several years. The editorial was evidently written without thought or full knowledge of the conditions of railway operation or of the qualifications and duties of the two branches of electrical service on railroads.

I went over one railroad last year that had changed *from* the method you suggest be adopted; the change resulting in all-around economy by having competent trained men handle the work. When the work was combined, men of limited knowledge in the maintenance of the motors, generators and other power machines would remove parts and install new parts to get the equipment going, just as the unskilled help did during the great railway strike and which resulted in a heavy loss to the railroad.

The plan is logical and economical so far as telephone, telegraph signals are concerned, and should be handled under one head; however, you are much mistaken in the statement—"Likewise it is contended that a man trained in the principles of electricity as every signal maintainer is (?) can readily inspect and repair the electric lighting equipment at passenger stations in his territory; furthermore these men with a limited amount of instruction can care for the electric motors and control equipment at such outlying points as drawbridges, water stations and coaling stations", for the reason that the telegraph and signal linemen (whose knowledge is limited to low voltage lines) run small iron wire and do ordinary lineman's work, are not familiar with power and lighting lines; this also applies to the signal maintainers. The federal agreements only gave them a second-class electrician's rating where 50 per cent or more time was spent doing the work of a qualified electrician.

They could not stand an examination such as required in cities to secure a permit card to do such work, and it has been our experience that such work as they have done has been rejected

by fire prevention and insurance inspectors and must be done over at more than double the expense. On one job we have on record the cost of $1,335 was incurred in making such changes after the signal men had wired their shop for power and lighting, and it was condemned by the insurance company. Only a small percentage of the material they installed could be used in revamping the wiring job to make it acceptable to the underwriters. Another pumping plant wired and installed by them on authority of a division superintendent had to be done over at double expense. As an illustration their cars were parked on a yard on which the nearest power and lighting line was 3,500 volts primary service. One of the force connected the service to the carlighting system. Only an act of providence saved his life. The entire lighting equipment on the cars was destroyed.

It is a matter of the "shoemaker sticking to his last". You might as well recommend your office boy to fill your chair, or turn the running of locomotives over to the fireman to save expense of engineers. It would be just as logical. Who will assume the responsibility for damages to property, injury to persons or possible death by having an inexperienced man work on power or lighting services or equipment for which they have not had proper training to handle properly or safely?

I have been over several roads on some of which the work was done as outlined in your editorial. Such roads having no standards or specifications do not even follow the National Electrical Code in their work. This is not only a discredit to the management but the wonder is, how they get it approved by their underwriters.

Your statement, "the plan can best be started on small roads or branch lines", should have added that it should be confined to such roads and then should be in the hands of a first-class man.

The eleven important roads having the signal and communication facilities under one department officer have taken the right step. It would, however, be utterly unwise for them to go further and attempt also to take over the class of work now handled by high-class mechanics under competent engineers trained in power and lighting service, which is entirely foreign to telegraph, telephone and signal work. Certainly every sane effort should be made to increase efficiency and effect economy, but some thought should be given to the ultimate results and we should not be misled into a false economy that in the end may lead to disaster and heavy expense.

AN ELECTRICAL ENGINEER.

Would This Happen in a Bus Office?

NEW YORK.

TO THE EDITOR:

I had a very illuminating experience this morning as to one of the reasons the railroads are having such great difficulty in selling their passenger service.

I was standing beside a ticket window in a well-known railroad station and there was a man ahead of me who had a daughter in a college not very far from New York. He wanted to buy a week-end, round-trip ticket from this college town to New York and return, and mail it to his daughter, explaining that his daughter had difficulty in getting to the station. Furthermore, he would rather send her the ticket than have her buy it. The ticket clerk explained that this could not be done and that the ticket would have to be purchased in the college town.

At this point I butted in and suggested to the man that I thought if he went to the district passenger agent, whose office was not far away, he would probably get such a ticket. The ticket clerk then volunteered the information that the passenger agent was in the back of the office and he would have him come to the window. He went back and talked to the district passenger agent, who did not even take the trouble to come to the window, but sent back word that it was impossible to get such a ticket and that it would have to be bought in the college town.

It has been my experience since I left the railroad business that this is a very fair sample of the passenger department's attitude to the public. No one who has a commodity to sell could possibly succeed under such conditions and certainly there is no great difficulty in selling tickets from a central office from or to any point on a railroad. In the old days it was quite generally done.

FORMER RAILROADER.

New Book

American Railroads—Four Phases of Their History, by Winthrop M. Daniels. 120 pages, 8½ in. by 5¼ in. Bound in cloth. Published by the Princeton University Press, Princeton, N. J. Price $1.50.

For a concise and readily-acquired background to current railroad problems little more could be asked than Professor Daniels offers in this volume which contains in essence the four lectures delivered by him at Princeton University in 1932 on the Stafford Little Lectureship on Public Affairs. The book is never dull since the author, who is the Thomas DeWitt Cuyler Professor of Transportation at Yale University and a former member of the Interstate Commerce Commission, proceeds with clarity and a fascinating vigor of style to his consideration in turn of: The Railroads and Wall Street; The Railroads and Congress; The Railroads and the White House; and The Railroads and the Public.

That phase of railroad history which he labels "The Railroads and Wall Street" Professor Daniels divides into three periods, the first being the period of the "Individual Traders Market" when railroads, in the main, "were built by companies which obtained their capital in the vicinity of each road." Then came the "Era of the Railroad Magnate" emerging first during the decade preceding the Civil War, when, to use, as Professor Daniels does, the colorful language of Daniel Drew, the railroads "were spreading over the country like measles in a boarding school." It was in this period that railway leaders were leaders also in the securities markets and were setting a pace "which banking interests were content to follow." And, finally, there is the present "Era of Banking Control" when "financial initiative is in the investment bankers . . . not because the final ownership of railroads is found in New York . . . rather because investment bankers have voluntarily assumed and discharged in growing measure the more responsible duty of quasi-public trustees, the ultimate owners are content to entrust the function of control to the great financial houses of the Street."

The lecture on "The Railroads and Congress" traces the development of regulation from the agitations for the original Interstate Commerce Act through the supplementary statutes up to the passage of the Adamson Act of 1916 by which time "the railroad Sampson had been rather effectively shorn by the Congressional Delilah." Then with Transportation Act of 1920 came the "fostering guardianship" which "has proved to date to be a rather chill and distant embrace" and in connection with which, Professor Daniels, citing inland waterway subsidies which "cry aloud against the pretense of equal treatment," suggests that it is yet to be demonstrated "whether 'that crafty and insidious animal called a statesman or a politician' can be induced to play fairly with the railroads."

No orderly progression similar to developments in other phases of their history is found by the author when he considers "The Railroads and the White House." Railroad history in this connection has been "mainly episodic, dependent on the crisis of the hour, and the character, or even the temperament, of the nation's chief magistrate." The more dramatic of such episodes are recounted with much of the lecture devoted to events during the administrations of Theodore Roosevelt and Woodrow Wilson. The close of the latter, Professor Daniels says, saw the carriers embarked upon a new career, "but one whose grooves had been deeply carved by two outstanding occupants of the White House."

The fourth lecture—The Railroads and the Public—discusses the services offered by the rail carriers and suggests that "The eventual attitude of the public to the railroads will be powerfully affected by the public's release from the feeling of close dependence upon service and facilities which the railroads alone can offer." With the growth of other utilities, reducing the railroads from the role of the "central sun" to that of "only a large star" in the economic galaxy, Professor Daniels thinks that the political issue of public ownership "will no longer focus only on the railroad industry." He rather ventures the prediction that, should the railroads in this country become the first utility to be publicly owned, "the urge to effect the change is less likely to come from a public that feels it is being exploited, than from investors who would like to exchange their railroad securities for government bonds, and from employees who would prefer the shelter of Uncle Sam's payroll to the lay-offs and wage reductions they are now subject to."

Odds and Ends . . .

The Useful Box Car

The brighter minds of the country are thinking up all sorts of ways to make use of discarded railway box cars. One favorite expedient, we understand, is the sale of the box cars to farmers who want to use them as corn cribs, sheds, etc. Cars 40 ft. long, which will hold 900 bu. of corn, are selling at $10 each.

"Onward, Christian Soldiers"

There wasn't any pipe organ but there was a full chorus for hymn singing on a North Shore Line train which left Racine, Wis., on a recent Sunday morning. One car was chartered by the Sunday School class of the Second Presbyterian Church of Racine to make a visit to the children of the Irving Park Presbyterian Church in Chicago. The regular Sunday exercises of the Racine delegation were held on the train.

A 1,000,000-Mile Safety Record

Here is a real safety record. Locomotive Engineer Ben Smith of the Louisville & Nashville went to work on the throttle side of an engine cab in July, 1902. Since that time, he has accumulated a total of well over 1,000,000 miles, and not once has he himself suffered the slightest injury or caused injury to anyone else. Any locomotive engineer who can successfully dodge automobiles at grade crossings for more than 30 years deserves a lot of credit.

A Club Car As Is a Club Car

The club car which is now being operated regularly between New York and Miami, Fla., by the Atlantic Coast Line must top all existing records for unique railroad train equipment. The car is said to represent the ideas of Henry L. Doherty, president of the Florida Year-Round Club, as to the sort of railroad equipment that would be able to compete successfully with the recreational facilities offered by steamships on the New York-Florida run. The car has a dance floor and a three-piece orchestra to go with it, a gymnasium, a locker and shower room, a wading pool and a screen for motion pictures. If the Atlantic Coast Line can arrange to keep the car pumped full of cold, wet, salt air, the illusion of coastwise steamship travel will be complete.

A Relic of the Past

A little remembrance of the days when people used to ride on passenger trains came to light recently when E. E. Nelson, passenger traffic manager of the Northern Pacific, received from the agent at Butte, Mont., a ticket for the transportation of a passenger from Bozeman, Montana Territory, to Livingston, via the Northern Pacific. The ticket, dated August 22, 1883, was used for passage over a section of the Northern Pacific transcontinental line only a few weeks before the gold spike was driven at Cold Creek, Mont., to mark the completion of the first of the northern transcontinental routes. The ticket differs from passenger tickets now sold in that it bears no reference to the liability of the railway company for personal injury or damage to the property of the passenger. The ticket bears the signature of G. K. Barnes, who was general passenger and ticket agent of the Northern Pacific at the time, and who may be remembered by some of the older members of the railroad fraternity.

Champion Katy Fuel Saver

An all-time record for fuel economy on the Missouri-Kansas-Texas was established by Locomotive Engineer C. P. Curtis, when he made engine No. 401 get along on only 650 gal. of oil in pulling train No. 6, with 11 cars, from Parsons, Kan., to Franklin, Mo., a distance of 198 miles, on November 8. Thus did Mr. Curtis bring to a climax his excellent fuel saving record. During the preceding month, he had made three other runs notable for low fuel consumption, each with a different fireman and each between Parsons and Boonville, 195 miles. On one run with 7 cars, only 580 gal. of oil were used for the 1,365 car-miles, or an average of 0.42 gal. of oil per car-mile. A few days later, pulling 9 cars, Mr. Curtis made the same trip on 665 gal. of oil, or 0.37 gal. for each of the 1,755 car-miles. Five days later, with a 7-car train, a record of 0.34 gal. per car-mile was set. If our arithmetic is correct, the record made on November 8 represented fuel consumption of less than 0.30 gal. of oil per car-mile. Of course, he may have had the wind behind him that day, but we imagine that skill had considerable to do with the establishment of Mr. Curtis' records. Railroads desiring to hire him away from the Katy are advised to form a line to the right.

Bridge on Wheels

Contract and auction bridge on wheels, with two days of continuous play while the participants ride from Boston, Mass., to Montreal, Que., and return, will be introduced to the card-playing world on January 14, when the Boston & Maine will operate the world's first "Bridge Train," with none but bridge players allowed on board. The bridge devotees will start playing in specially arranged Pullman cars when the train leaves North Station in Boston at 9 a. m., and the games will continue, with tournaments in every car, until the train rolls into Montreal around 7 o'clock that evening. After a night's rest in Montreal—where there are things to do besides play bridge—the games will be resumed at 9 o'clock the next morning, when the train begins its return trip to Boston. Leading experts and instructors of bridge in New England will be in charge of the various cars and the tournaments. The sponsors of the train conceived the idea after the railroad received a request from a number of bridge enthusiasts that they be insured an opportunity to play cards, on a week-end trip between Boston and Montreal, without interruption and without the expense of hiring private accommodations. Cards, prizes and tournament fees are all provided in the train, with the entire trip priced at less than half the usual fare.

Signalman Kissiloff Wrestles with Himself—and Wins

Through the courtesy of J. M. Pelikan of the Union Switch & Signal Company, we are privileged to publish a little story with a great big moral, which was one of the high spots of a recent issue of the newspaper, "Pravda", the official organ of the U. S. S. R. The story, which carried the catchy caption, "A Man with Real Proletarian Instincts, or The Episode of Signalman Kissiloff," reads as follows:

The evening darkness was surrounding the tracks of station Samozvanka on the Kurski Railroad. Not far from the station, at the signal shanty, was stationed Signalman Kissiloff, whose duty it was to clear the block signals for trains running to Kursk or to Moscow.

Suddenly the attention of Kissiloff was drawn to a pillar of fire which seemed to be alongside of the track not far from the signal shanty. It was the house in which Kissiloff lived.

What was he to do? Leave his post to put out the fire, endanger the passing trains, neglect the honest duty of a proletarian to his Soviet country, cover himself with shame? Or, stay at his post, lose his property, gathered together by means of hard labor, leave his wife and children without help?

Kissiloff decided to sacrifice his own in order that public property would not come to harm. He did not leave his post.

He saw how the flames ate the house along with all his furniture, heard how the roof and walls were falling, and when, within two hours, his substitute came, Kissiloff found, instead of his house, only ruins. Everything was burned. His frightened family was taken in by neighbors.

In our Soviet country, ever new heroes of labor are being born who are fighting for socialism. Into the ranks of these enters Kissiloff, who did his proletarian duty.

The board of commissars of the Kurski Railroad showed their appreciation of the exemplary conduct of this signalman. The head commissar of the railroad, Comrade Petrikovski expressed his appreciation in the name of the railroad and at the same time gave Kissiloff 500 roubles. The head of the division was instructed to have a new house built for Kissiloff, paid for by the railroad's funds, and within two days to furnish Kissiloff and his family necessary clothes.

NEWS

Study Shows Rubber Traffic Deserting Rails

Report by Ohio commission shows 54 per cent by rail in May—38 per cent in October

The enormous volume of rubber products shipped from Akron and Barberton, Ohio, by truck to all points of the United States, and the recent rapid increase in the percentage of total shipments conveyed by truck is disclosed in a recent study made by the Public Utilities Commission of Ohio. The study compares the week beginning May 1, 1932, with that beginning October 30—six months apart.

In the May week 9,462,239 lb. were shipped by rail, or 54.1 per cent of the total, the remaining 45.9 per cent moving by truck. By the October week, however, trucks had captured 62.1 per cent of the business, totaling 8,164,254 lb., leaving but 37.9 per cent for the railroads. There was, it will be observed, a large decline in total tonnage—but the loss by the railroads was 67.3 per cent, while that of their highway competitors was 36.9, or only a little more than half.

The percentage distribution of business in the two weeks by states receiving important volumes of tonnage was as follows:

State	May 1-7, 1932 Lb. Via Truck	May 1-7, 1932 % Via Truck	Oct. 3-Nov. 5 % Via Truck
Alabama	154,580	55.0	64.9
Arkansas	20,013	41.4	25.6
California	11,514	3.5	7.8
Colorado	6,643	20.3	75.8
Connecticut	132,165	77.7	60.0
Dist. of Col.	44,200	21.4	13.9
Florida	2,102	1.5	.5
Georgia	54,209	16.3	41.3
Illinois	585,897	72.6	87.2
Indiana	403,064	79.0	67.9
Iowa	145,363	65.4	55.5
Kansas	31,111	34.9	37.9
Kentucky	103,156	45.9	66.3
Louisiana	17,072	10.0	13.2
Maine	—	—	3.7
Maryland	69,516	27.7	38.7
Massachusetts	297,841	42.8	65.6
Michigan	913,514	31.6	55.9
Minnesota	111,937	34.0	88.0
Mississippi	—	—	21.3
Missouri	504,118	56.9	77.5
Nebraska	113,234	56.3	61.4
New Hampshire	37,422	86.0	74.1
New Jersey	331,283	38.3	44.7
New York	1,143,861	43.9	68.9
North Carolina	79,499	63.3	71.7
North Dakota	—	—	10.4
Ohio	931,914	84.9	97.7
Oklahoma	122,653	77.5	70.7
Pennsylvania	1,128,031	65.4	65.4
Rhode Island	20,444	68.3	90.8
South Carolina	23,880	32.0	1.3
South Dakota	18,061	65.9	27.1
Tennessee	77,932	31.8	42.8
Texas	135,452	50.3	36.5
Utah	2,139	23.9	22.7
Virginia	64	.02	5.2
Washington	6,675	69.4	18.4
West Virginia	60,606	65.1	50.7
Wisconsin	164,134	28.5	46.7

Calvin Coolidge Dies

Calvin Coolidge, Ex-President of the United States, and chairman of the National Transportation Committee, the investigating body sponsored by insurance companies and other owners of railroad securities for a study of the present railway situation, died suddenly of heart failure at his home in Northampton, Mass., on the morning of Thursday, January 5. Mr. Coolidge was 60 years of age.

Transcontinental Railroads Appeal to Coolidge Group

Ask that rail lines be placed upon equality with steamships using Panama Canal

Supplementing the recommendations filed by the Association of Railway Executives, with the National Transportation Committee, the investigating body headed by former President Calvin Coolidge, whose sudden death is announced above, a statement with respect to the effect of transportation through the Panama canal on the transcontinental railroads, has been filed by Paul Shoup, vice-chairman of the Southern Pacific, acting in behalf of the Transcontinental railroads. In this statement a demand is made that the railroads be placed upon an equality with the steamships using the Canal, in order that they may have some chance to compete successfully for transcontinental traffic. To accomplish this purpose it is asked that the Interstate Commerce Act be amended so as to relax somewhat the arbitrary control which the I. C. C. now exercises over transcontinental railroad rates, while transcontinental water rates are entirely unregulated.

Hitherto the commission has prevented the railroads making competing rates for transcontinental traffic, on the theory that these rates are not "reasonably compensatory." It is this policy to which the railroads object, holding that the determination of what is and what is not a "compensatory" rate is a managerial function and not a regulatory one. They hold that this policy has practically robbed them of much of their transcontinental business, by placing them under unequal conditions with the Canal in bidding for competitive business.

In the second place it is declared to be

(*Continued on page 28*)

R.F.C. November Report Lists Loans to Railways

Statement shows distribution by states of amounts advanced to pay railroad taxes

Up to November 30 the Reconstruction Finance Corporation had authorized 95 loans to 56 railroads, aggregating $328,519,202, according to its monthly report made public last week. Of this total $258,740 had been cancelled or withdrawn, $66,594,265 remained at the disposal of borrowers, and $261,666,197 had been disbursed to them, of which $11,714,562 had been repaid. In the same period the corporation had authorized 9,330 loans to all classes of borrowers, aggregating $1,593,011,223.

In the same period the Interstate Commerce Commission had approved loans to railroads aggregating $359,478,000, on applications amounting to $469,541,888.

The proceeds of loans authorized to railroads were to be used for the following purposes:

For completion of new construction	$47,746,483
For construction and repair of equipment and Dotsero Cutoff by Denver & Rio Grande Western	12,550,000
To pay interest on funded debt	73,959,547
To pay taxes	19,606,946
To pay past due vouchers for wages, materials, etc.	19,630,040
To pay principal of maturing equipment trust notes	20,660,513
To retire maturing bonds and other funded obligations	75,068,618
To pay loans from banks	37,788,900
To pay other loans	16,143,526
Miscellaneous	5,364,629
	$328,519,202

The rate of interest on the aggregate of $12,550,000 authorized for construction and repair of equipment and the Dotsero cutoff was 5 per cent, while all other loans authorized to railroads bore 6 per cent interest. The 5 per cent rate was made to encourage undertaking the work for which the loans were made and thus afford employment. The rate for the next six months has been placed at 5½ per cent.

The $73,959,547 of loans authorized to railroads to be used to pay interest on their funded debts was immediately disbursed by them to the holders of their securities—insurance companies, savings banks, private investors, trust funds and other owners of railroad bonds.

The $19,606,946 authorized to pay taxes was immediately passed on by the borrowers and went largely to the support of state and local governments. The corporation has received information from the borrowing roads showing the distribution

by states of $17,941,276 of the amount lent to pay taxes:

Alabama	$450,920
Arkansas	1,310,773
California	103,879
Colorado	254,800
Delaware	15,000
District of Columbia	206
Florida	7,948
Georgia	873,804
Illinois	2,582,876
Indiana	424,330
Iowa	223,601
Kansas	704,075
Kentucky	11,962
Michigan	4,137,182
Minnesota	258,919
Mississippi	68,934
Missouri	756,384
Montana	12,058
New Jersey	2,850,663
New York	133,780
North Dakota	457,500
Ohio	175,419
Oklahoma	1,098,914
Pennsylvania	425,290
South Carolina	17,828
Tennessee	412,073
Texas	7,100
Virginia	2,047
Wisconsin	163,000
	$17,941,276

Federal income taxes amounting to $25,994 were also paid by the borrowers out of money advanced for tax purposes.

The $19,630,040 authorized for payment of past due vouchers for wages, materials and supplies was immediately disbursed to those to whom the borrowing roads owed money for wages and goods furnished.

The amounts authorized to pay $20,660,513 of maturing equipment trust notes, to retire maturing bonds and other funded obligations, $75,068,618, and to pay off $16,143,526 of other loans, consisting almost entirely of secured notes, all passed or will pass into the hands of the owners of those securities—insurance companies, commercial and savings banks, foundations and trusts and individual investors. The $37,788,900 authorized to pay off or reduce loans from banks was authorized to 19 railroads.

Railroad Credit Corporation Loans

According to the monthly report of The Railroad Credit Corporation for December, filed with the Interstate Commerce Commission, that corporation had either actually made or authorized loans to railroads to meet their fixed interest obligations totaling $47,114,632. Of that amount, $46,931,732 represented loans actually made, leaving a balance of $182,900 to which the corporation is committed. Reported rate increases, under Ex Parte 103, according to the report, totaled $52,201,092 in the first ten months of 1932, and amounted to $5,981,462 in October.

In a letter addressed to chief executives of participating carriers and accompanying the report, E. G. Buckland, president of The Railroad Credit Corporation, said that 57 railroads had applied for loans in the aggregate sum of $105,990,446, of which $55,364,408 was removed from the docket, as being receivable from some other source, and/or denied; $48,324,919 had been approved, while pending applications totaled $2,301,119.

Seek Lower Grain Rates in Canada

A reduction of approximately 20 per cent in railway rates for transportation of grain and grain products along the all-rail and lake-and-rail routes from Fort William, and the Georgian Bay route, to Ontario, Quebec, New Brunswick and Nova Scotia, formed the basis of demands filed with the Canadian National and Canadian Pacific in Montreal last week by a special committee representative of the Canadian National Millers' Association, the Ontario Millers' Association, the Montreal Grain Exchange and the Toronto and Montreal Boards of Trade. Submission of the demands to both railways followed conferences between representatives of the varied grain interests which were held at the Montreal Board of Trade.

In asking for a reduction the grain interests submitted the plea that in the interests of the trade in the four provinces, it was desirable that rates be brought nearer the pre-war level in view of present economic conditions. They pointed out that though minor reductions in rates had occurred since the Great War, major increases, on the other hand, had also been made.

Grain Exchanges Ask Discontinuance of Rate Investigation

The Chicago Board of Trade and eleven other organizations, including the principal western grain exchanges, have petitioned the Interstate Commerce Commission to dismiss in their entirety the proceedings in connection with its general investigation of freight rates on grain and grain products in the western district, on which a rehearing is being conducted following the decision of the Supreme Court of the United States setting aside the commission's order.

The petitioners submit that not only will the dismissal of the proceedings be beneficial in removing a feeling of uncertainty but it will also have the added effect of creating a more flexible rate structure in permitting the carriers a broader latitude in the exercise of their managerial discretion to cope with the present abnormal conditions, by granting reductions in rates even though of a temporary character, "which they are now prevented from doing because any voluntary reductions which the carriers otherwise could make might be made the basis for a finding of the reasonableness of such rates for the future in the present proceeding." The opinion is expressed that if the proceedings are dismissed the railroad executives "will see the economic need for the downward revision of rates, where circumstances require, in order to insure a free movement of traffic."

Four Per Cent Decrease in Carloading Estimated For First Quarter

Freight car loading in the first quarter of 1933 will be four per cent less than the actual loadings in the same quarter of 1932, according to estimates compiled by the thirteen Shippers' Advisory Boards, based on replies of approximately twenty thousand shippers to a questionnaire sent out by the boards each quarter.

In the estimates just completed, shippers located in three regions—Great Lakes, Ohio Valley and the Southwest—expect an increase in car loadings in the first quarter of 1933 compared with the same period in 1932. In the first named region, the Great Lakes, it is estimated there will be an increase of 4.8 per cent; while an increase of 6.1 per cent is expected in the Ohio Valley and an increase of 1.5 per cent in the Southwest Region.

Of the twenty-nine commodities covered in the forecast, it is anticipated that five will show an increase in loadings in the first quarter of 1933 compared with the same period in 1932. They are: Cotton; citrus fruits; sugar, syrup and molasses; automobiles, trucks and parts; and chemical and explosives. The largest increase, according to the estimates, is for automobiles, trucks and parts, for which an increase of 18.9 per cent is expected. Estimates as to loadings of citrus fruits in the first quarter of 1933 compared with the same period in 1932, amount to 16.4 per cent; while for cotton an increase of 11.6 per cent is anticipated.

Bill for Railroad Reorganizations Introduced

A plan for bringing about voluntary railroad reorganizations largely through proceedings before the Interstate Commerce Commission in lieu of the usual form of receivership is proposed in a bill introduced in the House on December 29 by Representative La Guardia, of New York, as H.R.13,958. A plan by which a railroad, by admitting its insolvency, could petition a court for approval of a plan of reorganization without receivership on consent of three-fourths of its creditors has also been proposed in a draft of a bill being considered by a joint sub-committee of the House and Senate judiciary committees, as an amendment to the national bankruptcy act, but the tentative bill deals also with other corporations and individuals.

The La Guardia bill, understood to represent minority views, deals separately with railroads. It provides that a railroad, stating that it is unable to meet its liabilities as they mature, and that it desires to effect a plan of reorganization, may file a petition with a court, which would refer the plan to the Interstate Commerce Commission for approval. It also provides that upon application of 20 per cent of any class of creditors, bondholders, or stockholders, the commission may direct the railroad corporation, or the receivers of such a corporation, to file a petition for reorganization which would bring it within the bankruptcy jurisdiction of the court. Provision is then made for the calling of a meeting of bondholders, creditors, and stockholders, at the order of the commission, and the chairman of the commission, or any member thereof appointed by him, would be authorized to appoint a reorganization committee.

Electric Progress on the Pennsylvania

The Pennsylvania plans the early establishment of electric passenger train service between New York and Philadelphia. The change from electric to steam power, and vice versa, will be made for the through east and west trains at Paoli, on the main line, 20 miles west of Philadelphia, and for the trains to and from Washington and the south at Wilmington, Del. The platform on both sides of the tracks at Paoli will be lengthened to accommodate the longer trains and several hundred feet of ad-

ditional tracks will be constructed along the eastbound side of the railroad. At Wilmington the present station and track facilities are ample for these purposes.

Through trains between the east and the west will be hauled by electric power between New York and Paoli, except those which are scheduled to enter the old Broad Street station; these will make the change of motive power at that point. On the Washington line, through trains will be hauled between Wilmington and New York by electric power, except that those scheduled to enter Broad Street station will change locomotives there.

The electric locomotives for the through trains have been received and are now hauling test trains back and forth over the line between Trenton and Paoli, and from Trenton to Wilmington.

The overhead wire construction between New York and Philadelphia has been completed, and the first test train to run under complete electric power between these two cities will be operated within the next ten days.

Senate Committee To Consider Pension Bill

The Senate Committee on Interstate Commerce has announced that hearings will be held beginning on January 11 on the bill introduced by Senator Wagner, of New York, to provide for the establishment of a pension system for railway employees.

San Francisco-Los Angeles Overnight Freight Service

The Southern Pacific on January 5 established overnight freight service between San Francisco, Cal., and Los Angeles, 471 miles, for the transportation of l. c. l. shipments, thereby cutting 18 hr. from the former schedule. Pick-up and delivery service is provided through the Pacific Motor Transport Company, a subsidiary.

Lewis Appointed Director of Valuation

The Interstate Commerce Commission, on Thursday, January 5, announced the appointment of former Commissioner E. I. Lewis, whose reappointment for another term as commissioner was not confirmed by the Senate, as Director of Valuation, succeeding C. F. Staples, deceased. Commissioner Lewis has been in charge of the Commission's valuation work since 1921.

Census Report Shows Decline In Production of Transportation Equipment

The number of establishments engaged in the manufacture of transportation equipment, air, land, and water, in the United States, declined from 2,550 in 1929 to 2,037 in 1931, according to a preliminary report by the Bureau of the Census of the Biennial Census of Manufactures in 1932. The number of wage earners employed in such establishments (average for the year) declined from 583,355 to 375,003 and their total wages from $943,221,905 to $468,574,953. The cost of materials, containers for products, fuel, and purchased electric energy was $3,683,148,078 in 1929 and $1,738,219,110 in 1931 and the value of the products was $6,047,209,390 in 1929 and $2,889,307,799 in 1931.

The report also shows a decline in the number of railroad repair shops from 2,297 in 1929 to 2,156 in 1931, and the value of their product decreased from $1,269,916,839 in 1929 to $740,762,962 in 1931.

National Rivers and Harbors Congress

The twenty-eighth annual convention of the National Rivers and Harbors Congress will be held in Washington on January 17 and 18. According to the official notice one of the most important subjects for discussion will be the program of legislation recently announced by the Association of Railway Executives. It is also proposed to advocate that a rivers and harbors bill be passed at the present session of Congress.

Club Meetings

The Central Railway Club of Buffalo, (N. Y.) at its annual dinner on Thursday evening, January 12, at the Hotel Statler, will listen to an address on "Who Will Pay " by J. M. Fitzgerald, vice-chairman of the Committee on Public Relations of the Eastern Railroads. Mr. Fitzgerald will discuss the St. Lawrence waterways project.

The Railway Club of Pittsburgh (Pa.) will hold its next meeting at the Fort Pitt Hotel, Pittsburgh, on Thursday evening, January 26. Thomas R. Cook of the Baldwin Locomotive Works will give an address, illustrated by stereopticon pictures, on the relation of locomotive operation to operating income.

Senate Committee Approves Hanger Appointment

The Senate committee on interstate commerce on January 4 voted to report favorably to the Senate on the confirmation of the President's appointment of G. W. W. Hanger as a member of the United States Board of Mediation for a new term beginning January 1. Mr. Hanger's term expired at the end of the year but an exception was made in his case to the general rule adopted by the Democratic leaders of the Senate not to confirm President Hoover's appointments and the appointment was referred to the committee. Mr. Hanger appeared before the committee and was questioned briefly about the work of the board.

The C. P. R. in November

In November, net operating revenues of the Canadian Pacific amounted to $3,324,291, a decline of $1,241,083 from the net for November of last year. Gross revenues for November, $10,730,832, showed a decrease of $3,012,373 from gross for the corresponding month of last year.

The sharp reduction in operating expenses, which in November amounted to $7,406,540, as compared with $9,177,831 in November of last year, brings the operating ratio down to 69.02.

Gross for the eleven months amounted to $114,235,513, a decrease of $21,859,377 from gross for the same period of 1931, but for the same period of this year operating expenses were reduced by $17,804,409, so that net operating revenues for the eleven-month period at $17,779,235 showed a decrease of only $4,054,968 from the net for the same period of last year.

Hearings on Federal Full-Crew Bill

A large number of officers and representatives of the railroad labor organizations appeared before the House committee on interstate and foreign commerce at Washington on January 3 and 4 in support of the full-crew bill, H.R. 11,012, introduced at their request last year by Representative Shallenberger. Introductory statements urging the importance of such legislation from the safety standpoint were made by Donald R. Richberg, counsel for the Railway Labor Executives' Association, and J. A. Farquharson, national legislative representative of the Brotherhood of Railroad Trainmen, who told the committee that full-crew legislation is now in effect in 15 states, in some cases more stringent and in others less stringent than that proposed in the bill; but that in general its provisions, if enacted, would require an additional member of train crews as compared with the number provided for in the agreements now in effect on many railroads. W. D. Jackson, representing the B. R. T., told the committee that the additional operating expense that would be required by such legislation should not be considered; that it would be less than would be represented by the railroads and that it would be offset to a considerable extent by speeding up and improving the service. Although the unemployment argument was not directly raised he devoted a good deal of his time to detail testimony to show instances in which railroads have reduced train crews during the depression period. The bill would require two brakemen for freight trains of less than 50 cars and three for trains of more than 50 cars and for switching crews.

The bill would also require a crew of four or five men for single-unit self-propelled vehicles, such as gas-electric cars.

Representative Lea, citing statistics showing a steady reduction in accidents accompanied by a constant increase in train lengths, asked Mr. Richberg if he had any statistics to show the necessity for such legislation at this time. He said it seems to be "about the most inopportune time in twenty years" to bring up such a subject in view of the financial condition of the railroads. Mr. Richberg replied that such times emphasize the need for legislation because of the great pressure upon the railroads to disregard safety requirements. He said there is much controversy as to the statistics because, while they give an appearance of improved safety in railroad operation, they do not show the distinction between severe and minor injuries and the hazard of severe injury has increased. However, he said, the statistics for even a good year such as 1929 show that injuries impose a terrific toll on the railroad employees and he urged the committee to look at the existing hazard rather than at comparisons. When Mr. Lea asked what concrete evidence could be presented Mr. Richberg said he thought the best evidence would be the testimony of railroad operating men who have daily experience of the conditions.

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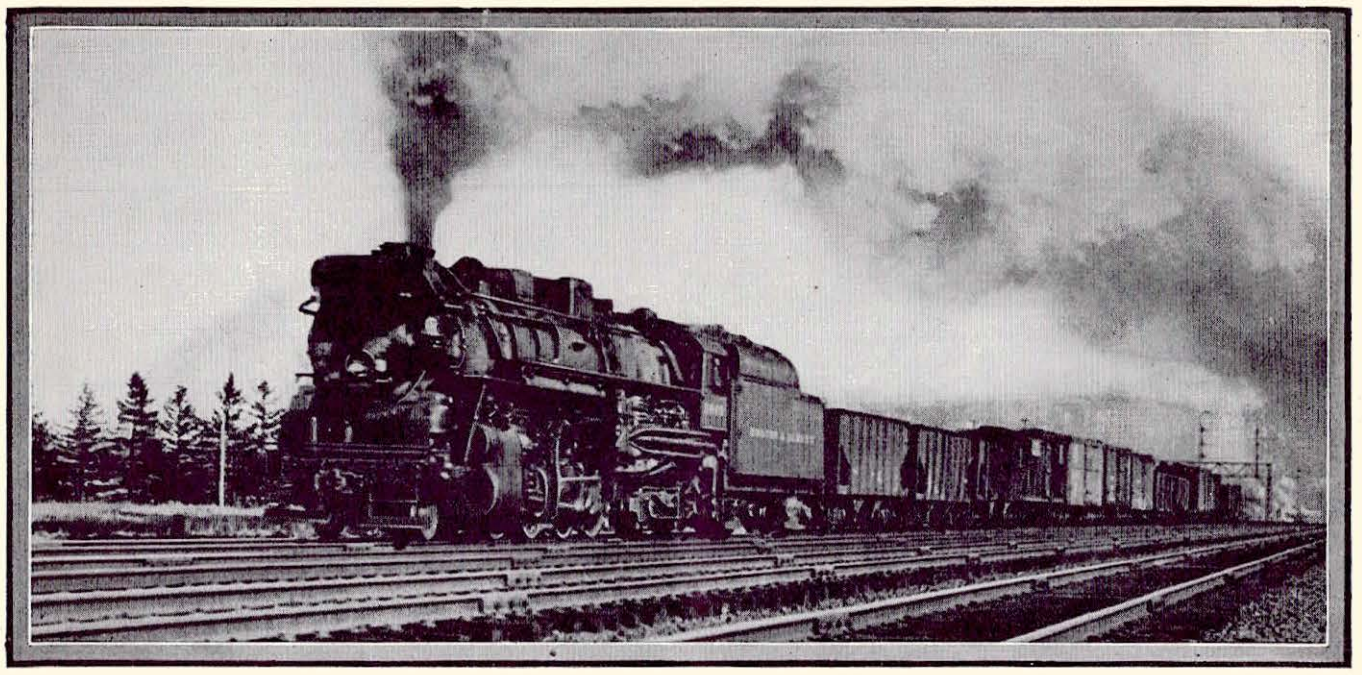

Berkshire Type Locomotive on the Boston and Albany pulling a west bound freight through Riverside, Mass.

Boston and Albany cuts its schedules with LIMA SUPER-POWER LOCOMOTIVES

Improved fast-freight service from Boston, resulting in one day's better delivery time to all western territory, has been established by the Boston and Albany Railroad. « Better service to shippers is one way of meeting competition. « But superior service cannot be supplied with the kind of locomotives you now have "white-leaded." « Better service requires modern power. Be sure you have enough of it to take care of traffic when business improves. « Not only has improvement in efficiency made old power obsolete but changed conditions of operation have also put many a locomotive on the scrap heap. Get ready now for better times. » » »

LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA LOCOMOTIVE WORKS
INCORPORATED
LIMA OHIO

Members of the committee asked if the bill should not include exceptions so that a full crew would not be required for single self-propelled units or three brakemen on local trains on branch lines. Thomas Stevens, representing the Brotherhood of Locomotive Firemen and Enginemen, gave some statistics he said had been compiled by the Atchison, Topeka & Santa Fe showing that more grade crossing accidents are caused by automobiles approaching from the firemen's side than from the engineer's side, to indicate the need for a helper for the locomotive driver to act as a lookout even if he has no firing to do. He said that any regulatory statute may impose requirements that seem burdensome in particular instances but he urged that no exceptions be made. He said the railroads had been trying to reduce the number of men on self-propelled units. Mr. Farquharson said that the bill rightly made no exception for local trains on branch lines and that there ought to be three brakemen on any train that does local switching or picks up or sets out freight so that one man may afford flag

CORRECTION

[Because of a printer's error, resulting in misplacement of lines, the table showing Operating Revenues and Operating Expenses of Class I Steam Railways in the United States for the month of October, 1932 and 1931, and for the ten months ended with October, 1932 and 1931, which was originally published in the *Railway Age* of December 24, 1932, page 962, was incorrect. The same table, as corrected, is again reproduced herewith.]

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from the Monthly Reports of Revenues and Expenses for 168 steam railways, including 17 switching and terminal companies

FOR THE MONTH OF OCTOBER, 1932 AND 1931

Item	United States 1932	United States 1931	Eastern District 1932	Eastern District 1931	Southern District 1932	Southern District 1931	Western District 1932	Western District 1931
Average number of miles operated	242,115.10	242,255.56	60,130.33	60,215.41	46,029.62	46,147.38	135,955.15	135,892.77
Revenues:								
Freight	a $244,074,324	$289,185,519	$99,742,406	$119,854,118	$46,348,813	$52,791,418	$97,983,105	$116,539,983
Passenger	26,179,386	38,198,706	16,146,288	22,860,756	2,712,061	4,116,443	7,321,037	11,221,507
Mail	7,804,188	8,659,395	3,125,144	3,435,124	1,296,116	1,444,376	3,382,928	3,779,895
Express	4,872,827	6,966,527	2,097,569	3,576,136	689,368	887,024	2,085,890	2,503,367
All other transportation	b 9,579,349	11,983,408	5,502,760	6,940,820	714,055	876,483	3,362,534	4,166,105
Incidental	5,443,225	7,555,148	2,983,098	4,049,638	692,705	922,657	1,767,422	2,582,853
Joint facility—Cr.	743,259	926,307	245,792	315,920	122,350	152,204	375,117	458,183
Joint facility—Dr.	235,051	289,249	62,317	70,217	18,671	26,367	154,063	192,665
Railway operating revenues	298,461,507	363,185,761	129,780,740	160,962,295	52,556,797	61,164,238	116,123,970	141,059,228
Expenses:								
Maintenance of way and structures	29,266,929	42,003,914	10,979,279	17,746,496	6,257,367	8,682,334	12,030,283	15,575,084
Maintenance of equipment	50,886,269	63,739,625	23,165,716	29,449,671	9,208,456	11,993,956	18,512,097	22,295,998
Traffic	7,446,914	9,588,862	2,790,480	3,914,668	1,365,268	1,771,772	3,291,166	3,902,422
Transportation	98,409,008	128,380,885	44,884,893	60,876,078	15,678,545	20,426,142	37,845,570	47,078,665
Miscellaneous operations	2,103,681	3,160,561	1,022,256	1,553,044	219,200	308,169	862,225	1,299,348
General	12,432,985	14,925,999	5,307,873	6,547,408	2,126,326	2,556,661	4,998,786	5,821,930
Transportation for investment—Cr.	398,994	574,614	191,730	170,452	22,861	74,529	184,403	329,633
Railway operating expenses	200,146,792	261,225,232	87,958,767	119,916,913	34,832,301	45,664,505	77,355,724	95,643,814
Net revenue from railway operations	98,314,715	101,960,529	41,821,973	41,045,382	17,724,496	15,499,733	38,768,246	45,415,414
Railway tax accruals	23,608,633	26,334,221	10,893,784	11,693,951	4,006,810	4,358,701	8,708,039	10,281,569
Uncollectible railway revenues	72,236	66,734	26,462	22,305	17,518	11,525	28,256	32,904
Railway operating income	74,633,846	75,559,574	30,901,727	29,329,126	13,700,168	11,129,507	30,031,951	35,100,941
Equipment rents—Dr. balance	8,073,308	8,325,012	3,868,149	4,147,334	d 14,443	d 124,610	4,219,602	4,302,288
Joint facility rent—Dr. balance	2,721,222	3,032,318	1,490,671	1,502,576	332,047	291,822	898,504	1,237,920
Net railway operating income	63,839,316	64,202,244	25,542,907	23,679,216	13,382,564	10,962,295	24,913,845	29,560,733
Ratio of expenses to revenues (per cent)	67.06	71.93	67.77	74.50	66.28	74.66	66.61	67.80

FOR TEN MONTHS ENDED WITH OCTOBER, 1932 AND 1931

Average number of miles operated	242,178.92	242,325.55	60,169.19	60,260.34	46,152.15	46,134.97	135,857.58	135,930.24
Revenues:								
Freight	c $2,060,620,349	$2,803,558,117	$879,485,886	$1,180,224,271	$394,093,069	$530,538,793	$787,041,394	$1,092,795,053
Passenger	322,033,469	474,526,490	192,015,219	272,223,417	36,497,892	57,546,981	93,520,358	144,756,092
Mail	79,757,394	86,430,434	31,600,272	33,493,501	13,465,762	14,554,256	34,691,360	38,382,677
Express	46,052,600	71,326,768	20,699,884	31,815,998	7,633,962	11,345,426	17,718,754	28,165,344
All other transportation	e 92,985,024	121,925,390	54,565,872	70,616,054	6,525,750	9,103,112	31,893,402	42,206,224
Incidental	55,692,679	77,849,094	31,355,440	41,175,274	7,129,213	10,637,287	17,208,026	26,036,533
Joint facility—Cr.	7,583,684	9,599,906	2,542,780	3,092,823	1,392,069	1,714,209	3,648,835	4,792,874
Joint facility—Dr.	2,433,604	2,814,488	651,278	749,365	187,197	254,990	1,595,129	1,810,133
Railway operating revenues	2,662,291,595	3,642,401,711	1,211,614,075	1,631,891,973	466,550,520	635,185,074	984,127,000	1,375,324,664
Expenses:								
Maintenance of way and structures	307,322,652	470,254,468	123,050,731	198,748,374	59,520,028	89,494,463	124,751,893	182,011,631
Maintenance of equipment	522,827,581	704,762,423	236,976,446	327,024,549	94,959,150	127,791,459	190,891,985	249,946,415
Traffic	81,813,787	99,156,880	31,381,937	38,704,633	15,126,117	18,278,885	35,305,733	42,173,362
Transportation	986,701,041	1,327,747,006	462,813,034	627,048,543	158,704,870	217,087,139	365,183,137	483,611,324
Miscellaneous operations	23,994,355	35,591,961	11,879,530	17,290,611	2,694,618	4,056,118	9,420,207	14,245,232
General	132,512,206	154,307,071	57,921,056	67,276,322	22,522,264	26,846,194	52,068,886	60,184,555
Transportation for investment—Cr.	3,658,342	6,228,337	1,281,258	1,221,983	260,581	740,994	2,116,503	4,265,360
Railway operating expenses	2,051,513,280	2,785,591,472	922,741,476	1,274,871,049	353,266,466	482,813,264	775,505,338	1,027,907,159
Net revenue from railway operations	610,778,315	856,810,239	288,872,599	357,020,924	113,284,054	152,371,810	208,621,662	347,417,505
Railway tax accruals	244,822,377	271,916,675	104,304,766	111,495,142	44,069,622	50,180,427	96,447,989	110,241,106
Uncollectible railway revenues	780,077	663,934	309,929	236,694	127,350	141,758	342,798	285,482
Railway operating income	365,175,861	584,229,630	184,257,904	245,289,088	69,087,082	102,049,625	111,830,875	236,890,917
Equipment rents—Dr. balance	72,191,454	84,210,400	36,076,134	41,762,324	3,462,609	4,239,497	32,652,711	38,208,579
Joint facility rent—Dr. balance	26,688,965	26,479,836	14,547,262	14,510,673	2,989,127	2,775,389	9,152,576	9,193,774
Net railway operating income	266,295,442	473,539,394	133,634,508	189,016,091	62,635,346	95,034,739	70,025,588	189,488,564
Ratio of expenses to revenues (per cent)	77.06	76.48	76.16	78.12	75.72	76.01	78.80	74.74

a Includes $6,071,596 increase from "Ex Parte 103." b Includes $94,304 increase from "Ex Parte 103." c Includes $52,897,734 increase from "Ex Parte 103." d Deficit or other reverse items. e Includes $892,572 increase from "Ex Parte 103."

Compiled by Bureau of Statistics, Interstate Commerce Commission. Subject to Revision.

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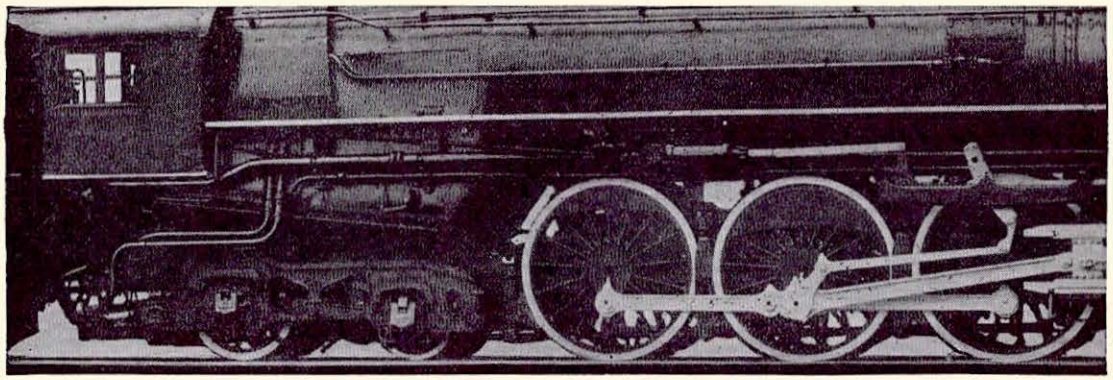

By designing a six driver engine with ample boiler capacity plus The Locomotive Booster instead of an eight wheel without the Booster we saved at least 2¢ per mile in maintenance.

—Operating Vice President of large railroad.

The Locomotive BOOSTER saves Maintenance Expense

The Locomotive Booster serves railroads in two definite capacities —as a power unit and as a means to reduce maintenance.

Primarily it offers the most economical method of securing extra power to increase gross ton miles per hour. It is one of the important elements that make Super-Power locomotives the efficient power plants they are today.

On road engines, the Booster gives the added punch that gets underway heavy trains the locomotive can handle at speed. It speeds up passenger, freight and yard service. It gives power when most needed—for starting, accelerating and to maintain speed on heavy grades. Not required at road speeds, it is cut out. Maximum operating economy results from capitalizing idle weight and spare steam.

THE FRANKLIN SLEEVE JOINT
Saves gaskets and lowers maintenance.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

protection. He said that very few railroads do not provide three brakemen on such trains.

The hearing was adjourned on Wednesday until Friday, because the committee was to have an executive session on Thursday to discuss the question as to its program for the remainder of the session. It was stated that witnesses for the railroads in opposition to the bill might be heard next week.

Charles A. Hammond Dead

Charles A. Hammond, formerly for many years secretary of the American Society of Railroad Superintendents, died in Rochester, N. Y., on December 30, at the age of 86. Mr. Hammond was born in Nahant, Mass., on August 14, 1846. He had had a varied and highly useful career as civil engineer. He was in early life in the service in the state of Massachusetts and was superintendent of the Boston, Revere Beach & Lynn, a short suburban line (then operated by steam) for about 14 years, ending in 1893.

His service as secretary of the superintendents' society covered a dozen years, more or less, from 1889 to the end of the Society's career about the end of the century; and Mr. Hammond was a leading spirit. That society, long since extinct, was small in numbers but very active, engaging the support of leading railroad officers in the southern states. Its activities, however, were in the same field as those of the important committees of the American Railway Association and the expansion of the latter meant the gradual death of the smaller body.

After his retirement from the Boston, Revere Beach & Lynn, Mr. Hammond engaged in a variety of engineering and railroad activities, including the superintendency of the Atlantic Coast Line (electric) Railroad in New Jersey; important new construction work in North Carolina and in the railroad supply field in New York City. He did important engineering work for the Interstate Commerce Commission and the American Railway Association.

A. R. E. A. Nominates Officers

The Nominating Committee of the American Railway Engineering Association has nominated the following candidates for office for the year beginning next March: President, W. P. Wiltsee, chief engineer, N. & W.; second vice-president, Robert H. Ford, assistant chief engineer, C. R. I. & P.; secretary, E. H. Fritch; treasurer, A. F. Blaess, chief engineer, I. C. In addition, J. E. Armstrong, assistant chief engineer, C. P. R., is automatically elevated from second vice-president to first vice-president.

Directors (three to be elected): Lem Adams, engineer maintenance of way, U. P.; E. H. Barnhart, assistant division engineer, B. & O.; W. F. Cummings, assistant chief engineer, B. & M.; G. S. Fanning, chief engineer, Erie; E. G. Hewson, engineer maintenance of way, C. N. R.; F. G. Jonah, chief engineer, St. L.-S. F.; W. H. Penfield, engineer maintenance of way, C. M. St. P. & P.; Dr. Hermann von Schrenk, consulting timber engineer; E. I. Rogers, president, P. & P. U.

Members of the Nominating Committee (five to be elected): H. Austill, bridge engineer, M. & O.; E. W. Caruthers, assistant engineer, Penna.; H. R. Clarke, engineer maintenance of way, C. B. & Q.; R. L. Cochrane, chief clerk to chief engineer, A. T. & S. F.; J. H. Hande, accounting engineer, B. & O.; E. R. Lewis, principal assistant engineer, M. C.; C. H. Mottier, engineer of design, I. C.; F. L. Nicholson, chief engineer, N. S.; C. B. Stanton, professor of civil engineering, Carnegie Institute of Technology; J. R. Watt, engineer maintenance of way, L. & N.

Transcontinental Railroads Appeal to Coolidge Group

(*Continued from page 24*)

necessary, "in order that stability may be given the rate structure, business confusion avoided through abrupt and radical changes without public notice, and railroads and steamship lines alike be assured of earnings necessary to provide a satisfactory service, that the steamship lines be brought under public regulation coordinated with that of the railroads; and that they as among themselves be protected against excessive and therefore destructive competition, injurious to the welfare of transportation both by rail and water."

Mr. Shoup presented statistics of transcontinental tonnage, showing that from 1914 to 1931 the movement westbound via the Panama Canal increased 547 per cent while the movement over the Southern Pacific lines decreased 24 per cent. Likewise, in this same period, eastbound transcontinental tonnage increased 651 per cent via the Panama Canal and only 33 per cent over the Southern Pacific.

Continuing he says: "These western main line rail systems, those serving the territory west of Chicago and St. Louis, and west of the Mississippi river south of St. Louis, constitute our greatest western industry. They represent an investment of capital of approximately 9 billion dollars, with some 350,000 stockholders, and gave employment in 1931 to 380,000 people directly, and a great many more indirectly. The people directly and indirectly interested in their bond and other interest-bearing securities number many millions. Of their earnings fully three-fourths are distributed in payrolls, purchases of supplies, and taxes along their lines, and even a greater proportion is so expended at this time. In many western states the taxes they pay are the major support of state government. In the sparsely settled regions whole communities are often dependent upon their payrolls. If then, earnings to the extent of 40 million dollars are restored to these railroads through their recovery of the same proportion of transcontinental traffic they enjoyed in 1921, the effect will be not only to give life to the railroads but also to communities they serve. The railroads have the plants, the organization and the personnel to carry a very much larger volume of traffic than they have enjoyed for a great many years past.

"Moreover, the diversion through the canal of traffic formerly enjoyed by the railroads has placed a greater burden of support upon the traffic remaining. Industries in the far west especially have to look to the eastern sections of the country for their principal markets. The cost of transportation is, therefore, a factor of marked importance. The industries of inland origin, lumber, minerals, grain, livestock and other farm products, which do not have opportunity to use the Canal service must be given good rail service for an average of long distance to their markets. And in the opposite direction there is a wide distribution of products of eastern manufacture in western territories not subject to water competition. This traffic, east and westbound, has to bear a much larger proportion of support of the railroads than would be the case if these railroads were able to secure a fair share of the traffic that has left them for the Canal."

In conclusion Mr. Shoup declares: "A public policy is not defensible under which one form of transportation using only rails or using rails and water combined, is not given equal opportunity to meet the competition of another form of transportation which varies from the first in that it uses water exclusively."

Meetings & Conventions

The following list gives names of secretaries, date of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—T. L. Burton, Room 5605, Grand Central Terminal Building, New York City.

ALLIED RAILWAY SUPPLY ASSOCIATION.—F. W. Venton, Crane Company, 836 S. Michigan Ave., Chicago. To meet with Air Brake Association, Car Department Officers' Association, International Railroad Master Blacksmiths' Association, International Railway Fuel Association, International Railway General Foremen's Association, Master Boiler Makers' Association and the Traveling Engineers' Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, F. T. R., M. & O. R. R., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J. 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—F. O. Whiteman, Room 800, 1017 Olive St., St. Louis, Mo. Annual meeting, June 13-15, 1933, Cleveland, Ohio.

AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.—E. A. Abbott, Poole Bros., Inc., 85 West Harrison St., Chicago. Next meeting, Jan. 21, 1933, Union League Club, Chicago, Ill.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, C. I. & L. Ry., 836 Federal St., Chicago.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—(See American Transit Association.).

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.

Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York.

Freight Station Section.—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York. Next meeting, June 26-27, 1933, Hotel La Salle, Chicago, Ill.

Protective Section.—J. C. Caviston, 30 Vesey St., New York. Next meeting, July 12-13, 1933, Stevens Hotel, Chicago, Ill.

Safety Section.—J. C. Caviston, 30 Vesey St., New York. Next meeting, October 3-5, 1933, Stevens Hotel, Chicago, Ill.

Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York. Annual meeting, June 13-15, 1933, Hotel Stevens, Chicago, Ill.

Division II.—Transportation.—G. W. Covert, 59 East Van Buren St., Chicago.

Division III.—Traffic.—J. Gottschalk, 143 Liberty St., New York.

Division IV.—Engineering.—E. H. Fritch, 59 East Van Buren St., Chicago. Annual meeting, March 14-16, 1933, Palmer House, Chicago. Exhibit by National Railway Appliances Association.

Construction and Maintenance Section.—E. H. Fritch, 59 East Van Buren St., Chicago.

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. . . $1.00 for arch brick pays for itself ten times

The last course of Arch brick works just as effectively as the other courses. It can be left off only at the expense of an increase in fuel consumption.

The economy of the locomotive Arch was thoroughly established years ago. More recent tests show that every dollar you "save" by cutting down on the length of Arch costs you ten dollars in the form of increased fuel; net loss nine dollars.

For economy of operation be sure that your locomotives leave the roundhouse with a full arch with every brick in place.

THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK

HARBISON-WALKER REFRACTORIES CO.
Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED
Locomotive Combustion Specialists » » »

Electrical Section.—E. H. Fritch, 59 East Van Buren St., Chicago.
Signal Section.—R. H. C. Balliet, 30 Vesey St., New York. Next meeting, May 9-10, 1933, Hotel Roosevelt, New York, N. Y.
Division V.—Mechanical.—V. R. Hawthorne, 59 East Van Buren St., Chicago.
Equipment Painting Section.— V. R. Hawthorne, 59 East Van Buren St., Chicago.
Division VI.—Purchases and Stores.—W. J. Farrell, 30 Vesey St., New York.
Division VII.—Freight Claims.—Lewis Pilcher, 59 East Van Buren St., Chicago.
Division VIII.—Motor Transport.—George M. Campbell, 30 Vesey St., New York.
Car Service Division.—C. A. Buch, 17th and H. Sts., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry. 319 N. Waller Ave., Chicago.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—J. A. Senter, Ind. Agt., N. C. & St. L. Ry., Nashville, Tenn. Annual meeting, Kansas City, Mo.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the American Railway Association. Division IV.—E. H. Fritch, 59 East Van Buren St., Chicago, Ill. Annual meeting, March 14-16, 1933, Palmer House, Chicago. Exhibit by National Railway Appliances Association.

AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.—Miss E. Kramer, M-K-T Employees Magazine, St. Louis, Mo.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C., M., St. P. & P. R. R., 11402 Calumet Ave., Chicago. Exhibit by Tool Foremen Suppliers' Association.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—R. E. Schindler, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Marion B. Richardson, *Railway Age*, 30 Church St., New York.

AMERICAN TRANSIT ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1104 Chandler Building, Washington, D. C. Annual meeting, January 24-26, 1933, Hotel Sherman, Chicago, Ill.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul Minn. Annual meeting, June 21, 1933, Chicago, Ill.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Station, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, Transportation Building, Washington, D. C.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—S. A. Baber, High Grade Manufacturing Co., 10418 St. Clair Ave., Cleveland, Ohio. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 2276 Wilson Ave., N. D. G., Montreal, Que. Regular meetings, second Monday of each month, except June, July, and August. Windsor Hotel, Montreal, Que.

CAR DEPARTMENT OFFICERS' ASSOCIATION.—A. S. Sternberg, M. C. B. Belt Ry. of Chicago, 7926 South Morgan Street, Chicago.

CAR FOREMAN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 2514 W. 55th St., Chicago. Regular meetings, second Monday of each month, except June, July, and August, Auditorium Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, Room 299, 610 So. Main St., Los Angeles, Cal. Club not active at present time.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—J. F. Brady, Main and Barton Sts., St. Louis, Mo. Operation suspended indefinitely.

CENTRAL RAILWAY CLUB OF BUFFALO.—M. D. Reed, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, second Thursday of each month, except June, July and August, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 2920 Utopia Place, Hyde Park, Cincinnati, Ohio. Regular meetings second Tuesday in February, May, September, and November, Hotel Gibson, Cincinnati, O.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Regular meetings second Monday of each month, except June, July and August, Auditorium, Brotherhood of Railroad Trainmen's Building, West 9th St., and Superior Ave., Cleveland.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich.

INTERNATIONAL RAILWAY CONGRESS.— January 19-30, 1933, Heliopolis Palace, Heliopolis, Cairo, Egypt.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—T. D. Smith, 1660 Old Colony Building, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn.

MASTER BOILER MAKERS' ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 270 Madison Ave., New York.

NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.—(See Railway Tie Association.).

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, Suite 322, 910 South Michigan Ave., Chicago. Exhibit during A.R.E.A. Convention, March 13-16, 1933, Coliseum, Chicago.

NATIONAL SAFETY COUNCIL.—Steam Railroad Section (See Safety Section, American Railway Association).

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, second Tuesday of each month, except June, July, August and September, Hotel Statler, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. W. Pye, 30 Church St., New York. Regular meetings third Friday of each month, except June, July and August, 29 W. 39th St., New York City.

PACIFIC RAILWAY CLUB.—W. S. Wollner, P. O. Box 3275, San Francisco, Cal. Regular meetings second Thursday of each month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, Transportation Building, Washington, D. C.

RAILWAY BUSINESS ASSOCIATION.—P. H. Middleton, (Treas. and Asst. Sec.), First National Bank Building, Chicago, Ill.

RAILWAY CLUB OF PITTSBURGH.— J. D. Conway, 1841 Oliver Building, Pittsburgh, Pa. Regular meetings, fourth Thursday of each month except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Meets with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division Purchases and Stores Division and Motor Transport Division, American Railway Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A. Division I.

RAILWAY TIE ASSOCIATION.—Roy M. Edmonds, 1252 Syndicate Trust Bldg., St. Louis, Mo. Annual meeting, May 10-11, 1933, Jefferson Hotel, Richmond, Va.

RAILWAY TREASURY OFFICERS ASSOCIATION.—L. W. Cox, 1428 Broad Street Station Building, Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Annual meeting, September 19-21, 1933, Hotel Stevens, Chicago, Ill.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Drawer 24, M. P. O., St. Louis, Mo. Meetings temporarily suspended.

SIGNAL APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York. Meets with A. R. A. Signal Section.

SOCIETY OF OFFICERS, EASTERN ASSOCIATIONS OF RAILROAD VETERANS.—M. W. Jones, Baltimore & Ohio, Mt. Royal Station, Baltimore, Md. Annual meeting, October 7-8, 1933, Scranton, Pa.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, 4 Hunter St., S.E., Atlanta, Ga. Regular meetings, third Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta, Ga.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & C. R. R., Atlanta, Ga.

SUPPLY MEN'S ASSOCIATION.—E. H. Hancock, Treasurer, Louisville Varnish Co., Louisville, Ky. Meets with A. R. A. Division V. Equipment Painting Section.

TOOL FOREMEN SUPPLIERS' ASSOCIATION.— E. E. Caswell, Union Twist Drill Co., 11 S. Clinton St., Chicago, Ill. Meets with American Railway Tool Foremen's Association.

TORONTO RAILWAY CLUB.—N. A. Walford, P. O. Box 8, Terminal "A," Toronto. Regular meetings first Friday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.

TRACK SUPPLY ASSOCIATION.—L. C. Ryan, Oxweld Railroad Service Co., Carbon & Carbide Building, Chicago. Meets with Roadmasters and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, O.

WESTERN RAILWAY CLUB.—J. H. Nash, Dri-Steam Valve Sales Corp., 122 S. Michigan Ave., Chicago. Regular meetings third Monday of each month, except June, July, August and September, Hotel Sherman, Chicago.

Equipment and Supplies

LOCOMOTIVES

THE CHESWICK & HARMER has placed an order for one 0-4-0 type oil-electric locomotive with the Baldwin Locomotive Works and the Westinghouse Electric & Manufacturing Company, the latter company to supply the electrical equipment and the power plant.

IRON AND STEEL

THE MICHIGAN CENTRAL has ordered 250 tons of steel for a bridge from the R. C. Mahon Company, Detroit, Mich.

THE NEW YORK CENTRAL is asking for bids until 12 o'clock noon, January 24, to be received by C. C. Warne, purchasing agent, New York, for 20,000 tons of steel to be used in the construction of the new St. Johns Park terminal, New York City.

THE BOARD OF TRANSPORTATION, New York City, will open bids January 13 for about 6,000 tons of track rail and about 400 tons of guard rail of 100-lb. sections. Bids are also being received at the same time for track accessories including tie plates, bolts, nuts, spikes, etc.

NEW YORK CENTRAL—A contract for 1100 tons of steel for the west side elevation improvement, between Bethune and Bank streets, New York City, has been given to the Jones & Laughlin Steel Corporation. The contract was let by the contractor, John Lowry, New York.

MISCELLANEOUS

THE CHICAGO & NORTH WESTERN on January 3 recalled 600 men to work in its Chicago car shops for an indefinite period. Freight car repairs will comprise most of the work.

FIFTEEN HUNDRED SHOPMEN will be put back to work on the Chicago, Rock Island & Pacific on January 9 for a period of 10 days for locomotive repair work at Silvis, Ill., Shawnee, Okla., and Horton, Kan.

Construction

PUBLIC SERVICE COMMISSION OF NEW YORK.—The New York Public Service Commission has directed the elimination of the Nanticoke crossing of the Erie, located one and one-half miles west of Endicott station, Union, N. Y. The commission has also amended its orders for elimination of various crossings of the Erie and the Delaware, Lackawanna & Western in Campbell, N. Y., and Bath; and has closed proceedings for elimination of grade crossings on the Long Island at Oakwood avenue, Islip, N. Y., and on the New York Central at Water street, Watertown, N. Y., and at Virginia avenue and North White Plains road, North Castle, N. Y.

Supply Trade

The Babcock & Wilcox Tube Company, New York, has appointed **Fritz Hoving** its West Coast district sales manager. Mr. Hoving will make his headquarters with **A. M. Castle & Company,** who are the West Coast agents of the Babcock & Wilcox Company at 2200 East Fifty-fifth street, Los Angeles, Cal.

John M. Mulholand, special representative, railroad sales, of the **Youngstown Sheet & Tube Company,** 111 West Washington street, Chicago, is handling sales of tie plates for the Youngstown Sheet & Tube Company, which are now being manufactured at its Indiana Harbor plant.

LeRoy Kramer, vice-president of the **General American Tank Car Corporation,** has also been elected president of the **Union Refrigerator Transit Company,** a subsidiary, to succeed **Walter Alexander,** who has been elected chairman of the board, with headquarters at Milwaukee, Wis. The headquarters of Mr. Kramer as vice-president of General American and president of the Union Refrigerator Transit Company will continue at Chicago.

The Electro-Motive Company and the **Winton Engine Corporation,** both divisions of **General Motors Corporation,** were, on January 1, consolidated under the name of **Winton Engine Corporation,** with headquarters as before at Cleveland, Ohio. The consolidation is intended to eliminate over-lapping functions thereby effecting greater efficiency and economy. The established policies of the Electro-Motive Company will be continued and its personnel will carry on the rail car and locomotive activities in the Winton Engine Corporation.

OBITUARY

George M. Bard, chairman of the board of the Barco Manufacturing Company,

George M. Bard

Chicago, who died in that city on December 21, was born in Alliance, Ohio, on July 22, 1852 and from 1869 to 1891, engaged in the hardware and the iron and steel business at Cleveland. In the latter year he became treasurer and manager of the Indiana Iron Company, Muncie, Ind., which position he held until 1899, when he became general superintendent and a director of the Republic Iron & Steel Company. In 1901, he resigned to become president of the Norwall Manufacturing Company, which position he held until 1907, when he became president of the Barco Manufacturing Company. He held this position until 1921, when he was elected chairman of the board, which position he held at the time of his death.

I. H. Milliken, vice-president of the McConway & Torley Corporation, died suddenly on December 30 in his office at Pittsburgh, Pa.

Austin J. Howley, lubrication engineer of the Standard Oil Company of New Jersey, died on December 30 at his home in Scranton, Pa., following an operation.

Financial

BOSTON & MAINE.—*Operation and Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon operation of its line between Palmer, Mass., and Barre, 17 miles, and to operate over the Boston & Albany between these points.

BOSTON & MAINE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $7,500,000 of first mortgage 6 per cent bonds, series LL, to reimburse its treasury for expenditures for additions and betterments, the new bonds to be pledged as collateral security for short term notes issued within the limitations of section 20a (9) of the Interstate Commerce Act.

CHICAGO, ROCK ISLAND & PACIFIC.—*Pledge of Bonds.*—The Interstate Commerce Commission has authorized this company to pledge not more than $3,792,000 of Rock Island, Louisiana & Arkansas first-mortgage 4½ per cent bonds as collateral security for short term loans.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon a branch line from Luverne, Minn., to Doon, Ia., 27 miles.

DELAWARE, LACKAWANNA & WESTERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to pledge $1,843,000 of bonds of subsidiary companies as collateral for a loan of $1,000,000 from the Railroad Credit Corporation.

EAST KENTUCKY SOUTHERN.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon as to interstate and foreign commerce its line extending from Grayson, Ky., to Webbville, 13 miles.

ERIE.—*Bonds.*—The Interstate Commerce Commission has authorized the New Jersey & New York to extend from January 1, 1933, to January 1, 1938, the maturity date of $631,000 of its general mortgage 5 per cent 40-year bonds.

ILLINOIS CENTRAL.—*Y. & M. V. Bonds.*—The Interstate Commerce Commission has authorized the Yazoo & Mississippi Valley to procure the authentication and delivery of $1,605,000 of 5 per cent improvement bonds, series Z, in reimbursement for capital expenditures.

LEHIGH VALLEY.—*Assumption of Liability.*—The Interstate Commerce Commission has authorized this company to assume liability as guarantor for not exceeding $6,342,000 of 5-year secured 6 per cent notes of the Lehigh Valley Coal Company, of which $2,000,000 will be pledged as part of the collateral security for a loan from the Reconstruction Finance Corporation.

LOUISIANA & ARKANSAS.—*Securities.*—The Interstate Commerce Commission has authorized this company to issue and renew or extend promissory notes not to exceed $750,000 at any time outstanding and to pledge not more than $104,000 of its first mortgage, 5 per cent bonds, series A as collateral security therefor or for any notes issued to the Railroad Credit Corporation.

MURFREESBORO - NASHVILLE.—*Acquisition and Securities.*—The Interstate Commerce Commission has authorized this company to acquire and operate a line extending from Nashville, Ark., to Murfreesboro, 14.5 miles, formerly owned by the Murfreesboro - Nashville Southwestern. The new company is authorized to issue $16,000 of common stock and $30,000 of first mortgage bonds for the purpose of acquiring and rehabilitating the line.

PENNSYLVANIA.—*New Director.*—Franklin D'Olier has been elected a director of this company, succeeding the late Jay Cooke. Mr. D'Olier is a vice-president of the Prudential Insurance Company and a director of several financial and industrial organizations of New York and Philadelphia, as well as Newark, N. J. He was the first National Commander of the American Legion.

PERE MARQUETTE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to pledge with the Railroad Credit Corporation its equity in $9,000,000 of first mortgage, series C bonds now pledged with the Reconstruction Finance Corporation and also to pledge all or any part of $386,000 of such bonds which it has in its treasury.

SAVANNAH & STATESBORO.—*Abandonment.*—The receiver has applied to the Interstate Commerce Commission for authority to abandon the entire line, from Cuyler, Ga., to Statesboro, 35 miles.

SOUTHERN PACIFIC.—*E. P. & S. W. Bonds.*—The Interstate Commerce Commission has authorized the El Paso & Southwestern to issue $2,962,000 of first and refunding mortgage bonds in reimbursement for capital expenditures, to be

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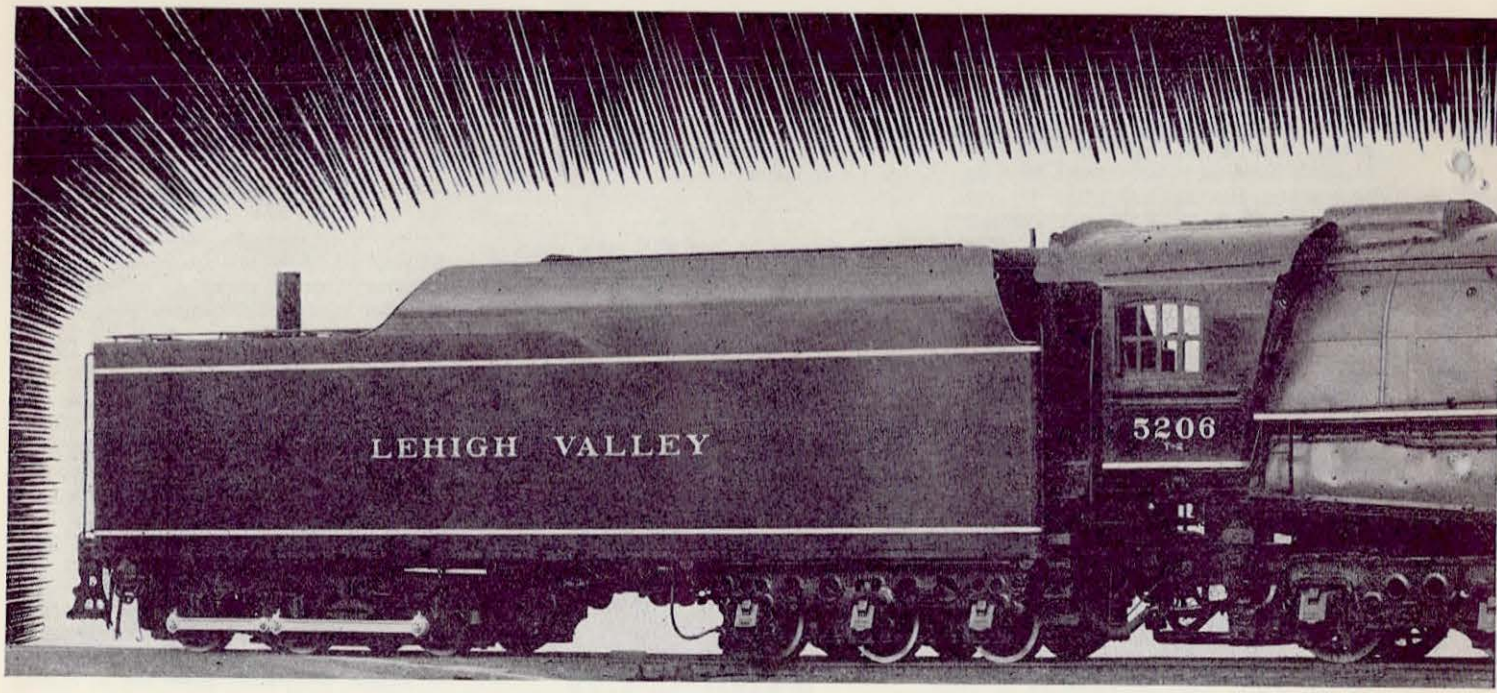


MODERN POWER RETURNS 38

Even Under Existing

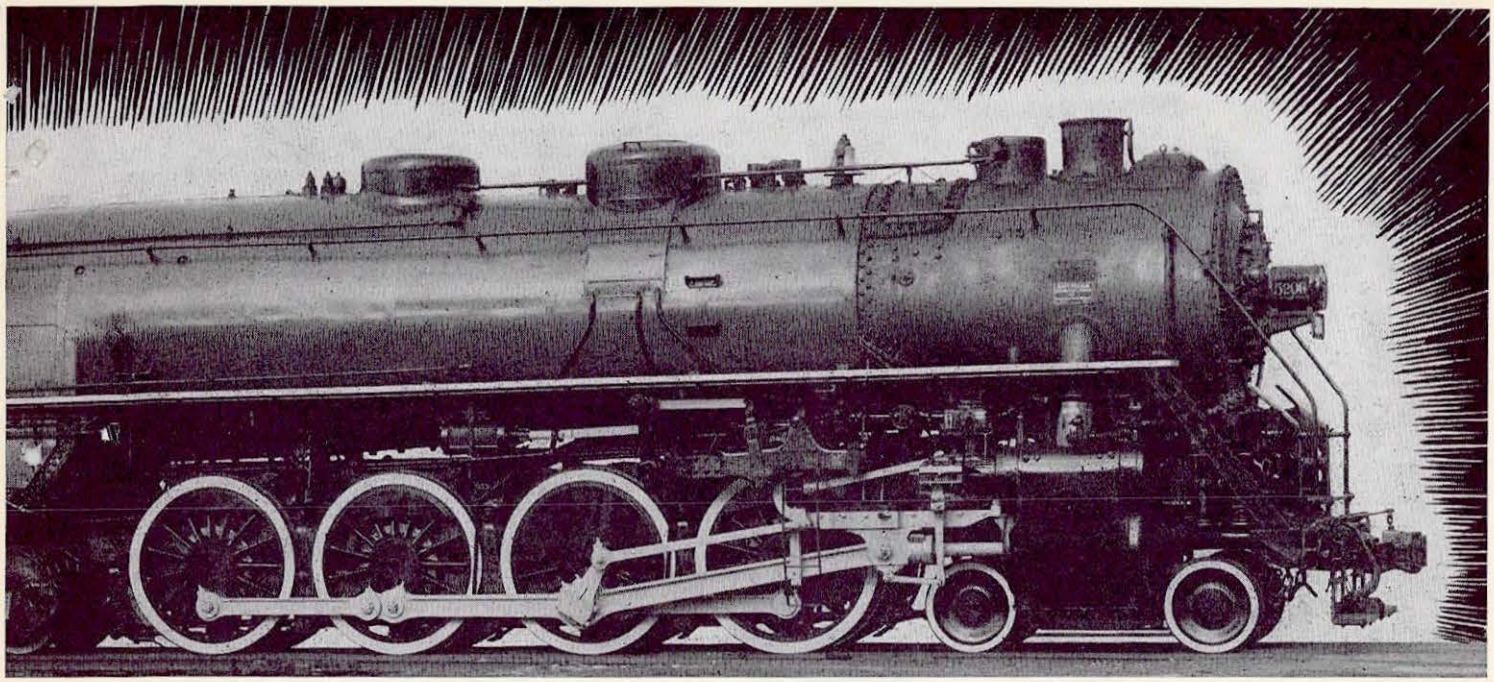
$900,000 a year is being saved by the Lehigh Valley on its recent investment of $2,340,000 in modern power—an annual return of 38 per cent. It took courage and vision to spend this money under existing light traffic conditions—but it paid—and paid big. This figure is based on the present utilization of the 20 modern locomotives acquired to replace 40 of the eight-year-old Mikados and fourteen-year-old Pacifics on the Niagara frontier—Jersey City runs.

There could hardly be a better demonstration of the economic value of modern power and how a railroad can improve its earning capacity by replacing obsolete power with modern power.

The $900,000 annual saving mentioned at the outset represents direct operating economies resulting from increased tonnages, which have permitted the elimination of 650,000 train-miles a year, greater fuel efficiency, fewer water stops and reduced helping services. The 20 new locomotives replaced 40 of the older 4-6-2 and 2-8-2 types on the Niagara frontier-Jersey City runs. With a reassignment of these latter and of others which they in turn supplant, the resultant total saving is expected to become more than $1,000,000 a year.

The distance between Suspension Bridge, N. Y., the Lehigh Valley's Niagara frontier interchange point, and its Oak Island yard in Jersey City is 449 miles. The preponderance of traffic is eastbound, and the ruling grade in that direction is between Coxton, Pa., and Mountain Top, a distance of 20 miles with a rise of 65 ft. to the mile. Here the old locomotives, hauling from 2,200 to 2,500 tons, required one and sometimes two helpers, whereas the new locomotives can haul from 3,000

AMERICAN LOCO
30 CHURCH STREET



PER CENT ON INVESTMENT

Light Traffic Conditions

to 3,500 tons with one helper. The result has been a reduction of five helping trips per day in this district. A like reduction has been made in the district between Easton, Pa., and West Portal, N. J., where the eastbound rise is 22 ft. per mile, and the westbound, 47 ft. No helping service is now required on this section of the line for trains hauled by the new locomotives.

Three of the older locomotives were assigned to each through run from Suspension Bridge to Jersey City, which now requires but one of the new locomotives. Changes were formerly made at Manchester, N. Y., and Sayre, Pa. To handle each round-trip daily schedule, only three of the new locomotives are now required. They are operated on a "first in-first out" basis, and each makes approximately 10,000 miles a month.

Fuel economies result from the fact that the more powerful locomotives will, with the same fuel consumption, haul heavier trains and thus produce more gross ton-miles per pound of coal; the saving in fuel on this unit basis is about 10 per cent. Also, there is a considerable saving in fuel as a result of reduced stand-by losses. The trains now being hauled consist of from 80 to 90 cars, or 25 more cars than the old locomotives handled, while schedules have been accelerated by 10 to 15 per cent.

What modern power has done for the Lehigh Valley it can do for other roads. And let us emphasize these points. The cost of obsolescence in the case of locomotives is particularly large because so many major improvements which reduce operating expenses have been made during the past five years. Furthermore, the loss on old locomotives costs more than replacement with modern power. Reluctance to recognize these facts is costing the railways annually millions of dollars in net revenue.

MOTIVE COMPANY
NEW YORK CITY

sold at not less than par and the proceeds used to repay advances.

WICHITA FALLS & SOUTHERN.—*Directors.*—D. E. Buchanan, Tulsa, Okla., and F. G. Robinson, Dallas, Tex., have been elected members of the board of directors of this company to fill vacancies caused by the resignations of J. R. Davis, Houston, Tex., and J. L. Jackson, New York.

Average Prices of Stocks and of Bonds

	Jan. 3	Last week	Last year
Average price of 20 representative railway stocks..	23.53	22.10	28.43
Average price of 20 representative railway bonds..	26.48	54.58	65.98

Dividends Declared

Mill Creek & Mine Hill Navigation & R. R.—10 Per Cent Guaranteed, 1¼ per cent, semi-annually, payable January 15 to holders of record December 31.

Northern Central.—$2.00, semi-annually, payable January 14 to holders of record December 31.

Norfolk & Western.—Adjustment Preferred, $1.00, quarterly, payable February 18 to holders of record January 31.

Piedmont & Northern.—75¢; Extra, $2.00, both payable January 10 to holders of record December 31.

Pittsburgh, Cincinnati, Chicago & St. Louis.—$2.50, semi-annually, payable January 20 to holders of record January 10.

Western New York & Pennsylvania.—Preferred, $1.25, semi-annually, payable January 1 to holders of record December 30.

Railway Officers

EXECUTIVE

Roy B. Jones has been elected chairman of the board of the Wichita Falls & Southern, with headquarters at Wichita Falls, Tex., to succeed **J. A. Kemp,** deceased.

J. P. Kelly, chief clerk to the vice-president in charge of traffic of the Chesapeake & Ohio and the Pere Marquette, has been appointed to the newly-created position of assistant to the vice-president in charge of traffic, with headquarters as before at Cleveland, Ohio.

Ethelbert W. Smith resigned as co-receiver of the Seaboard Air Line, effective January 1, to return to the Pennsylvania as vice-president, with headquarters at Philadelphia, Pa., in charge of consolidation work, and also with other duties directly under **W. W. Atterbury,** president.

Bracken Retires as Burlington Executive Vice-President

Edward P. Bracken, executive vice-president of the Chicago, Burlington & Quincy and the Colorado & Southern and allied lines, with headquarters at Chicago, has retired, effective January 1, and the position of executive vice-president of these lines has been discontinued. Edward Flynn, vice-president in charge of operation of the Burlington, at Chicago, has been elected also vice-president of the Colorado & Southern, in which capacity he will have jurisdiction over matters pertaining to this line that were formerly handled by Mr. Bracken.

In announcing Mr. Bracken's retirement from active service, Ralph Budd, president of the Burlington, commented as follows: "His knowledge of railroad problems generally is so thorough, his acquaintance with Burlington property and personnel so intimate and his judgment so sound that I feel it cause for congratulation to be able to say that his advice and counsel will be available at any time to the various executives."

Mr. Bracken's service with the Burlington extends over a period of more than 45 years. He first entered the service of the company in August, 1887, as a gang

Edward P. Bracken

foreman on the Lincoln division, and a year later he was appointed an extra gang foreman on the Wymore division. In 1889, Mr. Bracken was appointed a track foreman, and after serving in this position for a year he was advanced to roadmaster, in which capacity he remained for the next 13 years. He was then advanced to trainmaster, and in November, 1905, he was promoted to assistant superintendent of the Lincoln division. A year later Mr. Bracken was further promoted to division superintendent and served successively in this capacity on the Lincoln, Sterling, Sheridan, Brookfield and Galesburg divisions. He was promoted to general superintendent of the Wyoming division on May 15, 1909, and on February 1, 1910, he was further advanced to the position of assistant general manager of the Lines East of the Missouri river, with headquarters at Chicago. Two years later he became general manager of the Lines East, and in 1917 he was elected vice-president in charge of operation. On August 9, 1918, during federal control of the railroads, Mr. Bracken was appointed general manager of the Burlington, and on November 6, 1919, he was appointed federal manager. On the termination of federal control in 1920, he resumed the position of vice-president in charge of operation, which position he continued to hold until his election as executive vice-president, effective September 24, 1931.

FINANCIAL, LEGAL AND ACCOUNTING

E. I. Grenfell, general auditor of the Colorado & Southern, with headquarters at Denver, Colo., has been elected also secretary, in which position he will assume a portion of the duties formerly handled by **W. M. Holden,** secretary and treasurer, who will continue as treasurer.

James P. Doran, assistant auditor of freight and telegraphic receipts of the Canadian Pacific, retired effective January 1, and **J. Lummis,** chief clerk in the auditor's office, has been appointed to succeed Mr. Doran as assistant auditor of freight and telegraphic receipts. **E. J. Bulgin,** auditor of passenger receipts, with headquarters at Montreal, Que., also retired effective January 1.

OPERATING

H. P. Galbreath, assistant superintendent of the Southern Kansas division of the Missouri Pacific, with headquarters at Coffeyville, Kan., has retired because of ill health, and the position of assistant superintendent at Coffeyville has been abolished.

Effective January 1, **Thomas Collins,** superintendent of the Montreal terminals of the Canadian Pacific, **W. J. Uren,** assistant general superintendent of the Quebec district, and **J. A. MacGregor,** superintendent of the Moose Jaw division, Moose Jaw, Sask., retired.

J. M. Cameron, manager of the Esquimalt & Nanaimo, with headquarters at Victoria, B. C., has retired, and the position of manager has been abolished. **J. A. Kennedy,** superintendent at Victoria, has had his duties broadened to include those of manager.

H. G. Beasley, assistant commissary of the Chicago, Burlington & Quincy, with headquarters at Kansas City, Mo., has been promoted to commissary, with headquarters at Chicago, to succeed **A. E. White,** who retired on January 1, after more than 50 years' service with the Burlington. **A. Kleinert,** dining car inspector at Kansas City, has been advanced to assistant commissary, with the same headquarters.

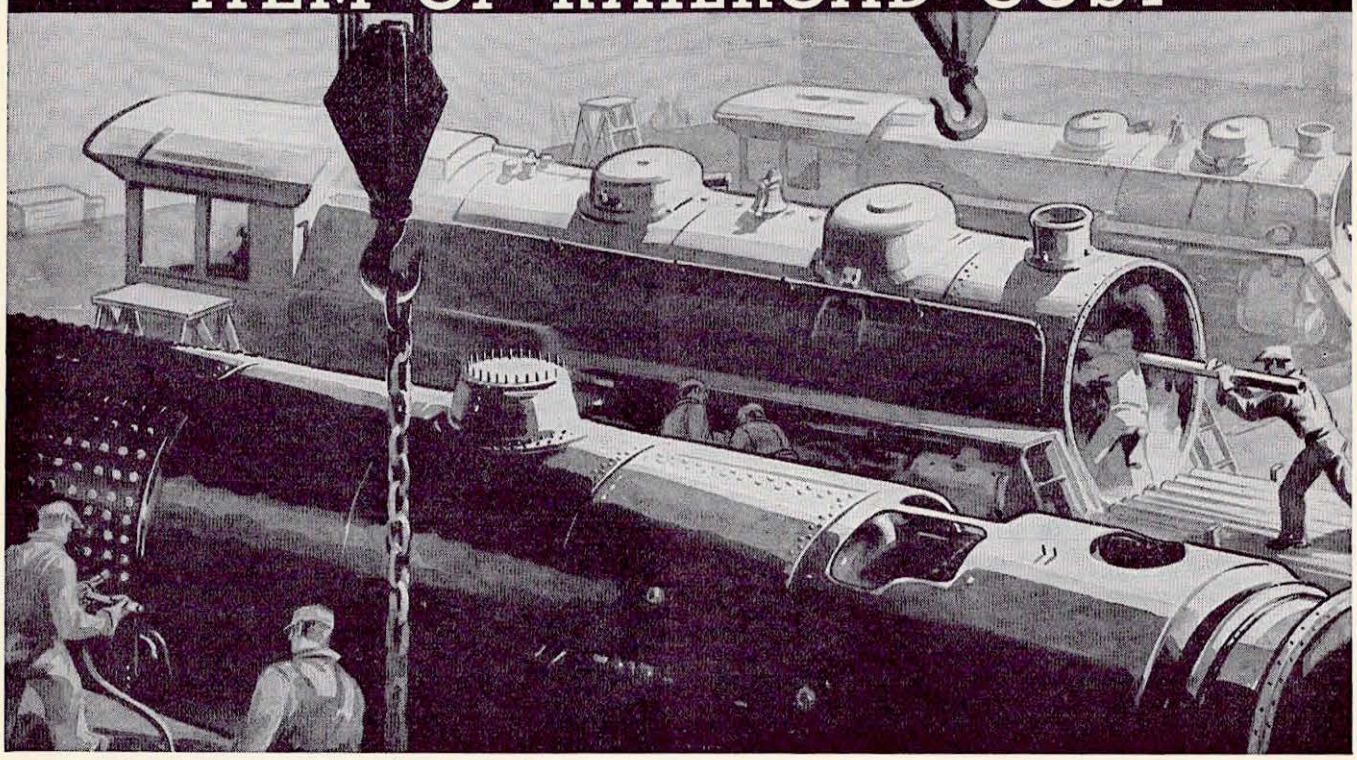
F. F. Riefel, superintendent of the Western division of the New York Central, with headquarters at Chicago, has been transferred to the Toledo division, with headquarters at Toledo, Ohio, succeeding **E. W. Brown,** who has been transferred to the Cleveland division, at Cleveland, Ohio. Mr. Brown succeeds **C. M. Williams,** who has been appointed assistant superintendent of the Cleveland Terminal district, at Cleveland, to replace **J. D. Bell,** who has been transferred.

Antonio E. Vera, superintendent of the Puebla division of the National Railways of Mexico, with headquarters at Puebla, Pueb., has been transferred to the Monterrey division, at Monterrey, N. L., to succeed **Alberto Galvan,** who in turn has been transferred to Puebla to replace Mr. Vera. **Margarito Ramirez,** who has been on a leave of absence, has been appointed superintendent of the Guadalajara division at Guadalajara, Jal., to succeed **Juan C. Garcia,** who has been transferred to the Jalapa division, at Jalapa, Ver. C., to replace **Pedro S.**

Continued on next left-hand page

HERE'S HELP

IN CONTROLLING THE LARGEST ITEM OF RAILROAD COST



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Alvarez, who has been granted a leave of absence.

Edwin D. Jones, superintendent of the Duluth-Superior division of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Superior, Wis., has had his jurisdiction extended to include the Winnipeg division, and the position of superintendent of the latter division, which has been held by **W. H. Mann,** with headquarters at Thief River Falls, Minn., has been abolished. The position of superintendent of telegraph of the Soo division, which has been held by **A. S. Harris,** with headquarters at Minneapolis, Minn., has been abolished, and jurisdiction over telegraph lines on this division has been assumed by **E. H. Buhlman,** general superintendent at Minneapolis.

TRAFFIC

E. S. Stephens, general freight agent on the Chicago & Eastern Illinois, has been appointed to the newly-created position of freight traffic manager, with headquarters as before at Chicago.

Leandro Valdés, assistant freight traffic manager of the National Railways of Mexico, has been promoted to traffic manager, with headquarters as before at Mexico, D. F., to succeed **J. D. Noriega,** deceased.

L. R. Robinson, general New England freight agent of the Canadian Pacific, with headquarters at Boston, Mass., retired on January 1, and **H. W. Hobbs,** New England freight agent, with headquarters at Boston, will have charge of the New England agency.

W. L. Huggins, Jr., director of publicity and assistant traffic manager of the St. Louis-San Francisco, with headquarters at St. Louis, Mo., has been promoted to traffic manager at Oklahoma City, Okla., succeeding **J. G. Weaver,** appointed general agent at the same point. **J. E. Payne,** assistant general passenger agent, with headquarters at Tulsa, Okla., has been appointed traffic manager at the same point, succeeding **J. W. James,** who has been appointed to the newly-created position of special traffic representative at Buffalo, N. Y.

ENGINEERING AND SIGNALING

W. C. Groth, division engineer of the Chicago Great Western, with headquarters at St. Paul, Minn., has been promoted to chief engineer at Chicago, succeeding **C. G. Delo,** who has been appointed real estate and tax agent at that point.

H. F. Brown, assistant district engineer on the Northern Pacific, has been promoted to district engineer, with headquarters as before at St. Paul, Minn., to succeed **Frederick J. Taylor,** who has retired, as announced in the *Railway Age* of December 31.

Lem Adams, engineer maintenance of way of the Union Pacific System, has been appointed chief engineer of the Union Pacific Railroad and the St. Joseph & Grand Island, with headquarters as before at Omaha, Neb. He succeeds **G. J. Adamson,** who has been appointed division engineer of the Kansas City division, with headquarters at Kansas City, Mo., succeeding **W. C. Perkins,** appointed roadmaster of the Oregon Short Line, with headquarters at Ashton, Idaho. The position of engineer maintenance of way of the Union Pacific System has been abolished.

MECHANICAL

Edward Eley, master car builder, Eastern lines, of the Canadian Pacific, retired on January 1. Mr. Eley entered the railway's service in 1889, as a carpenter in the bridge and building department at North Bay, Ont. In 1894, he was transferred to the car department and later served as car foreman at Quebec and Glen Yards. In 1911 he was promoted to general foreman at West Toronto; in 1912 he became division car foreman at North Bay, and in 1915 he was advanced to master car builder.

W. H. McAmis, superintendent of shops on the Missouri Pacific at North Little Rock, Ark., has been promoted to assistant mechanical superintendent, with headquarters at St. Louis, Mo., to succeed **W. G. Seibert,** deceased. **G. T. Callender,** master mechanic of the Central Kansas, Colorado and Wichita divisions, with headquarters at Osawatomie, Kan., has been appointed superintendent of shops at North Little Rock, to succeed Mr. McAmis. **George Schepp,** master mechanic of the Joplin-White River divisions, at Nevada, Mo., has been transferred to Osawatomie to replace Mr. Callender, and has been succeeded at Nevada by **Richard Kling,** assistant master mechanic of the Central Kansas, Colorado and Wichita divisions, with headquarters at Wichita, Kan. **R. E. Haussner** has been appointed assistant master mechanic at Wichita to succeed Mr. Kling.

PURCHASES AND STORES

The headquarters of **E. A. Workman,** manager purchases and stores of the Central of New Jersey, have been transferred from New York to Elizabeth, N. J.

M. C. Nystrom, chief clerk in the purchasing department of the Southern Pacific, Pacific Lines, at San Francisco, Cal., has been promoted to assistant purchasing agent, with the same headquarters, to succeed **G. M. Betterton,** whose appointment as purchasing agent was noted in the *Railway Age* of December 31.

SPECIAL

Joseph N. Redfern, manager of the relief, medical, employment and pension departments and chairman of the pension board of the Chicago, Burlington & Quincy, with headquarters at Chicago, retired on January 1 and the position of manager of these departments has been discontinued. The employment department has been placed under the jurisdiction of **Edward Flynn,** vice-president in charge of operation, while the relief, medical and pension departments have been placed under the supervision of **Bruce Scott,** vice-president and general counsel. **J. T. Williamson,** superintendent of the relief department, has been appointed also chairman of the board of pensions and superintendent of the employment department, with headquarters as before at Chicago. In the latter position Mr. Williamson replaces **W. C. Kordsiemon,** who has been appointed to the newly-created position of supervisor of service records. **D. B. Moss,** chief medical officer of the Burlington, has been appointed also medical director of the relief department.

Mr. Redfern was born at Trenton, N. J., on January 19, 1860, and entered railway service in 1876 as a telegraph operator on the Pennsylvania, serving this road until 1889, in this position and as a clerk in the foreign freight and relief departments. In that year Mr. Redfern left the Pennsylvania to go with the Chicago, Burlington & Quincy as chief clerk in the relief department at Chicago. Six years later he was advanced to assistant superintendent of the relief department and in 1903 he was further promoted to superintendent of the relief department. In 1907, Mr. Redfern's duties were extended to include supervision of the medical department, and a year later his responsibilities were further augmented by his appointment as superintendent of the employment department. He was appointed secretary of the pension department in 1922, and in 1924 he was placed in charge of the relief, medical, employment and pension departments with the title of manager, which position he continued to hold until his retirement. In 1925, Mr. Redfern was appointed also chairman of the pension board. He will continue to serve as a member of the railroad committee of six that is negotiating with representatives of railway labor organizations on the questions of pensions, retirement insurance and dismissal wages.

OBITUARY

J. S. Farlee, president of the St. Joseph, South Bend & Southern (part of the Michigan Central), died at New York on January 1, after a long illness.

Kenneth Gordon, assistant signal engineer of the Canadian National, with headquarters at Montreal, Que., died on December 25.

Strode P. Henderson, general manager of the Alton, with headquarters at Chicago, died on January 1 of heart disease.

Hugh Neill, vice-president and secretary of the Southern Pacific, died on December 31, 1932, at a hospital in New York, after suffering heart attacks. Mr. Neill was born on April 17, 1876, at Batesville, Ark., and received his education at Arkansas College, Batesville, from which he was graduated in 1894. He entered railway service with the Southern Pacific at Bakersfield, Cal., as a clerk on February 1, 1902. In January, 1913, he was appointed secretary, and in June, 1925, he became vice-president. He was also vice-president of the Southern Pacific Railroad Company of Mexico and assistant secretary of the Texas & New Orleans.

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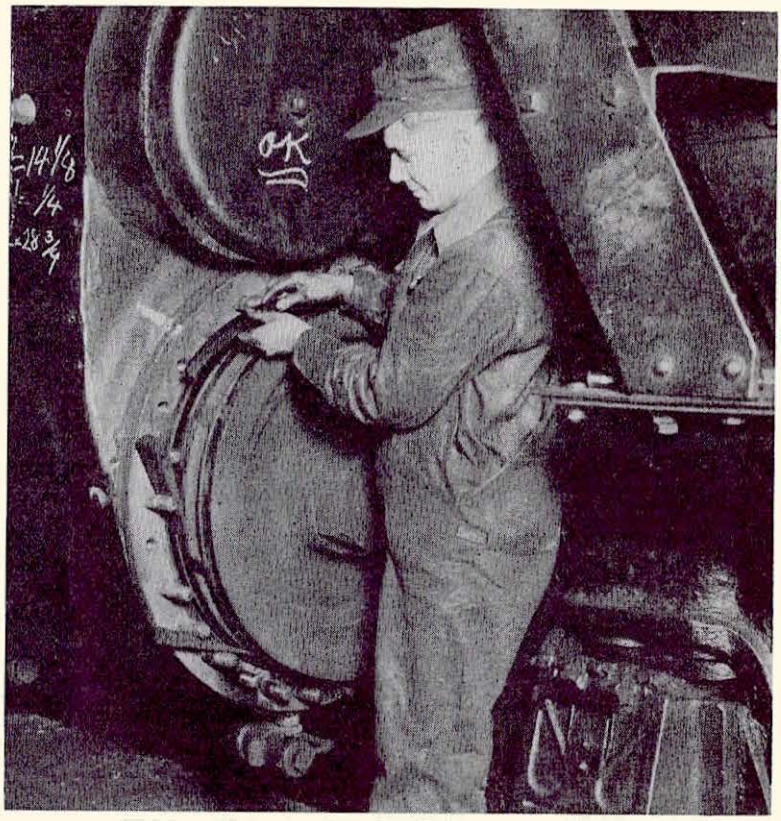

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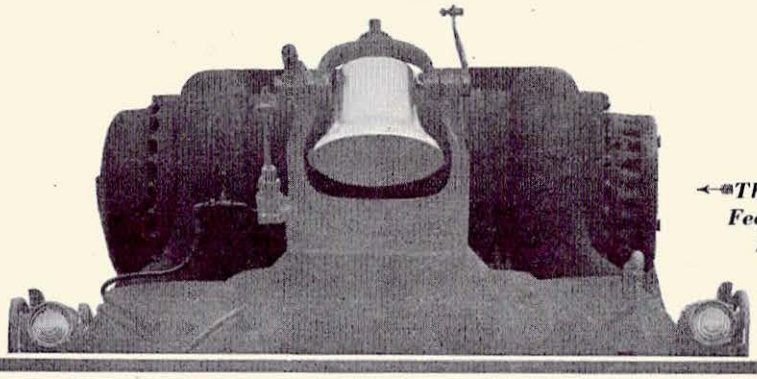

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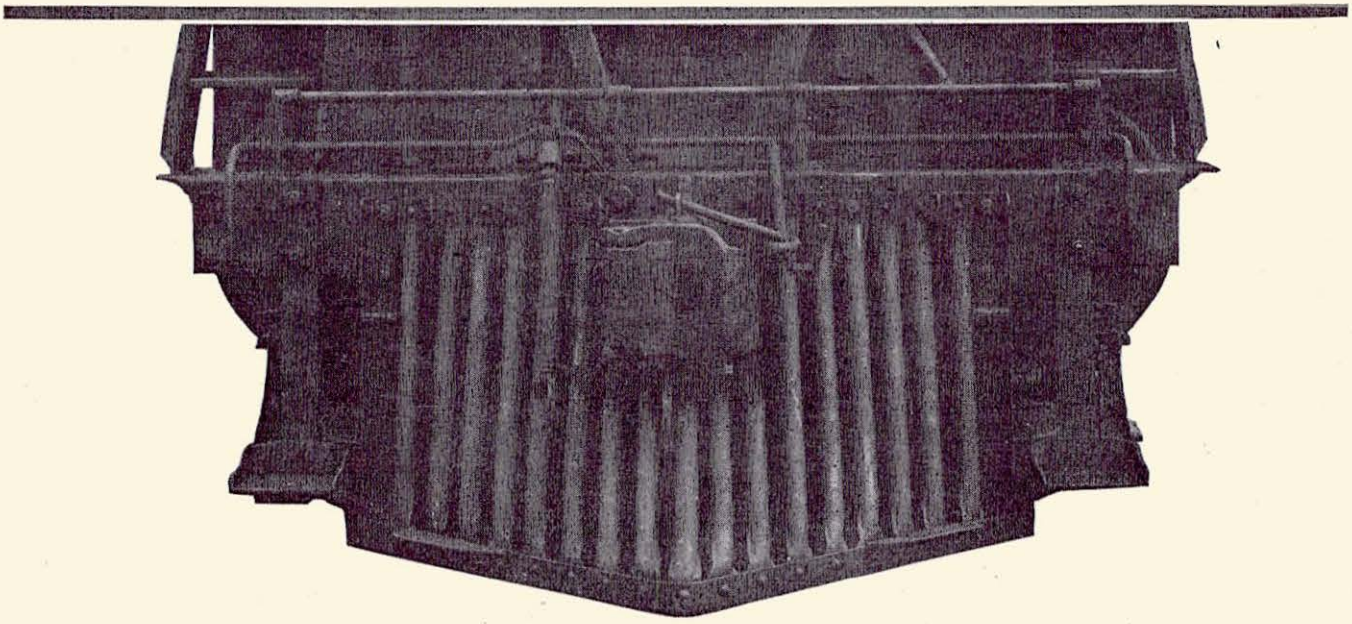
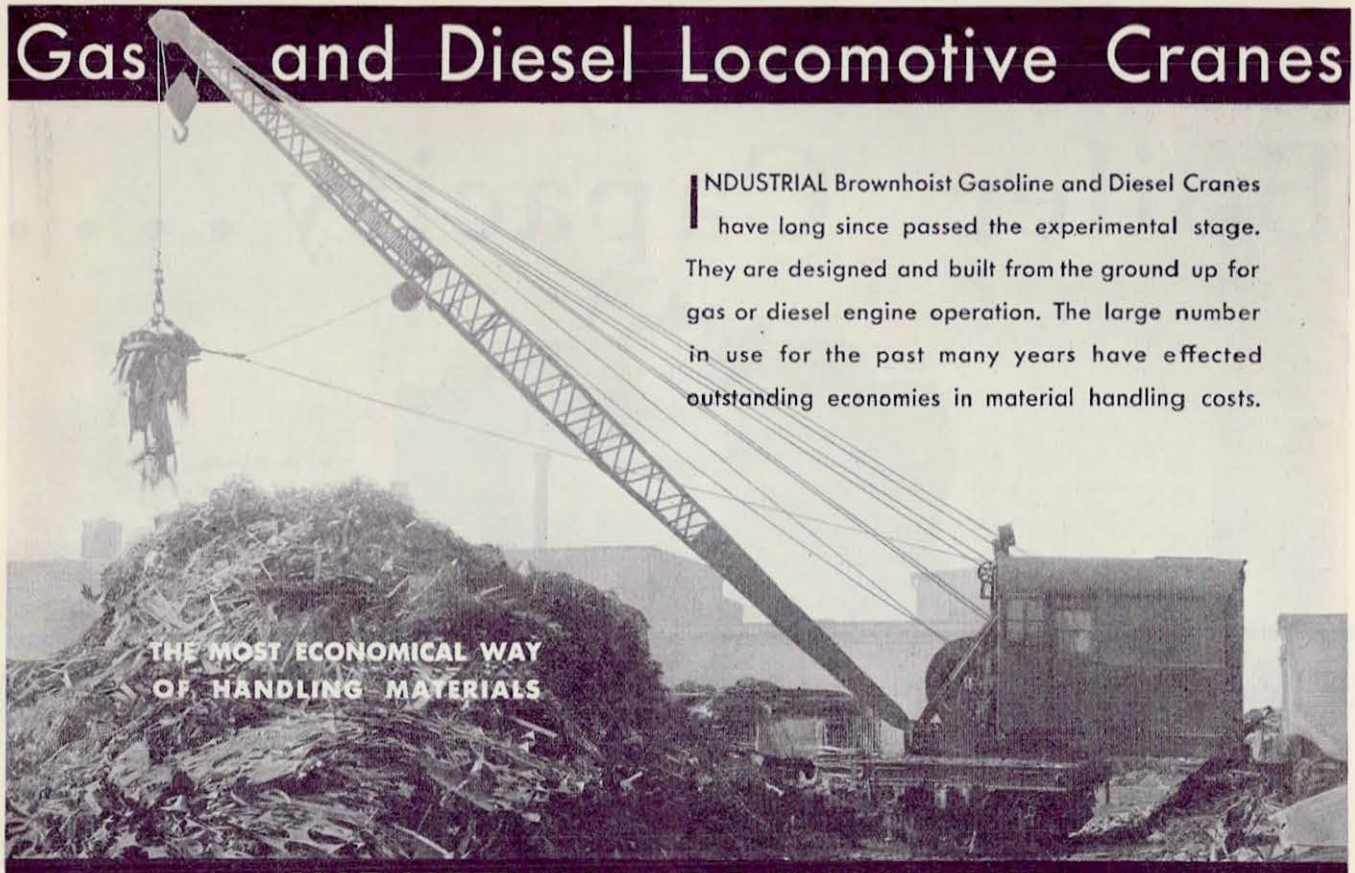


Gas and Diesel Locomotive Cranes



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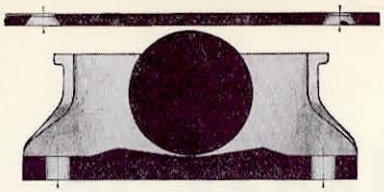

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These expenditures illustrate a type of improvement which some railways are continuing to make in these days and which are yielding returns of as high as 50 to 100 per cent on the investment. Such savings are independent of the number of trains and the returns will continue year after year.

*Railway Age Editorial, December 17, 1932.

UNION SWITCH & SIGNAL COMPANY
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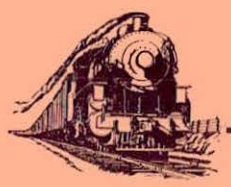
GENERAL RAILWAY SIGNAL COMPANY
Rochester, N. Y.



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Signals Aid Modern Motive Power to Produce More Ton-Miles Per Train-Hour